

PROJECT MANUAL

CASWELL MEMORIAL SP
Campground and Day Use Improvements
San Joaquin County, California
No. C26863031
November 2026

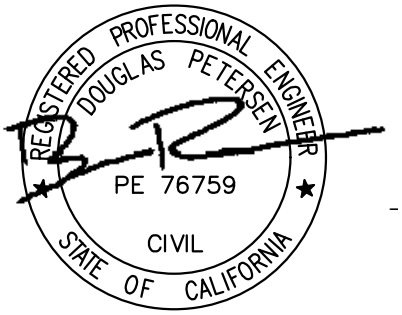
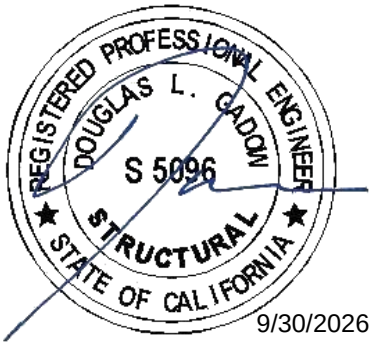
STATE OF CALIFORNIA
NATURAL RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION

CALIFORNIA DEPARTMENT
OF
PARKS AND RECREATION

CONTRACT DOCUMENTS

Caswell Memorial State Park
Campground and Day Use Improvements
Ripon CA
October 2026

PROJECT MANUAL
For
CASWELL MEMORIAL STATE PARK
CAMPGROUND & DAY-USE IMPROVEMENTS

APPROVAL STAMP	NAME
	Debra Dawn Guenther License # LA5346 Renewal Date: 2/28/2028
	Douglas Petersen License # PE76759
	Douglas L. Gadow License # S5096

	Robert N. Taketa License # E19863 Expiration Date: 3/31/2028

NATURAL RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION
CASWELL MEMORIAL SP
Campground and Day Use Improvements
San Joaquin County, California

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State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

SMALL BUSINESS PREFERENCE NOTICE

5% Small Business Preference

5% SMALL BUSINESS PREFERENCE PROGRAM

What is a California Certified Small Business (SB)?

1) For a business to be considered a Small Business (SB), they must be certified with the State of California - Department of General Services in accordance with California Code of Regulations, Title 2, Section 1896.94.
2) Your business may be eligible if it meets all of the following*:
   a. Must be independently owned and operated.
   b. Cannot be dominant in its field of operation.
   c. Must have its principal office located in California.
   d. Must have its owners (or officers in the case of a corporation) domiciled in California.
   e. Together with its affiliates, be either:
      - A business with 100 or fewer employees, and an average annual gross receipts of $16 million or less over the previous three tax years, **or**
      - A manufacturer with 100 or fewer employees.
   f. Microbusiness: A small business will automatically be designated as a microbusiness if gross annual receipts, together with all affiliates, are less than $5,000,000 or, the small business is a manufacturer with 25 or fewer employees.

   * For additional details visit the Department of General Services (DGS) website.

What is the Small Business Preference?

5% Small Business Preference: State law allows certified small business (SB) and microbusiness (MB) firms to receive a 5% bidding preference on applicable state solicitations. The 5% preference is also available for non-certified businesses who subcontract 25% of contract amount with a certified SB/MB. **In no event shall the SB preference or non-SB subcontracting preference exceed $50,000 in any single bid.**

The effect of the preference is to help SBs/MBs be more competitive in the bid process, thereby enhancing state contract awards directly or indirectly to SB/MB. The preference is only used for computation purposes to determine the winning bidder, the contract is awarded at the actual bid amount.

1. How does the 5% Small Business (SB) Preference Work?

a) The following example shows how the 5% preference computation works, and how it is used to determine a successful bidder.

Bidder	Bid Amount	Bid After 5% Preference	Small Business Status
1	$30,750	$30,750	Claims small business status, but is not CA certified
2	$28,975	$28,975	Does not claim to be a small business
3	$29,520	$29,520	Claims small business status, but their CA certification has expired
4	$29,870	$28,421	Claims small business and is CA Certified

b) Computation Method for example 4-a:

1. Five percent is applied to the **lowest (non-certified small business)** responsible bid ([Bidder 2] $28,975 x .05 = $1448.75).
2. The preference amount ($1,448.75) is subtracted from the certified small business (Bidder 4's) bid amount ($29,870 - $1,448.75 = $28,421.25).
3. Bidder 4's computed total is $28,421.25, making them the lowest bidder.
4. The contract is awarded to Bidder 4 for $29,870.

c) NOTE: *The 5% SB preference is applied to currently certified and registered small businesses and is used for bid evaluation purposes and* ***does not alter the bid's actual amount****.*

2. Documentation

a) Bidders must provide a printout from the State's SB/DVBE vendor system showing your certification and expiration date from the following web site. www.Caleprocure.ca.gov

b) If a non-certified firm is claiming the SB Preference based on subcontracting at least 25% of the contract to a certified SB/MB, you must include a complete GSPD 05-105 with your bid. An evaluated bid under the 25% SB subcontracting qualification cannot displace a certiffied and registered SB.

c) At completion of peformance and when SB participation was included toward SB goals under this contract, then the contractor must complete and submit form DPR 489 to the State's designated representative under this contract and within the time specified within the contracting documents or within 60 days of receipt of final payment, which ever is sooner.

3. Verification

Information submitted by the bidders to claim the SB Preference will be verified by the State. If evidence of an alleged violation is found during the verification process, the State shall initiate an investigation, in accordance with the requirements of the PCC §10115, et seq., and MVC §999 et seq., and follow the investigatory procedures required by the 2 CCR §1896.80. Contractors found to be in violation of certain provisions may be subject to loss of certification, penalties and/or contract termination.

4. To locate SB/MB contractors:

a) Contact the department's contracting official named in this solicitation for any SB/MB contractors who may have identified themselves as potential subcontractors, and to obtain suggestions for search criteria to possibly identify SB/MB contractors for the solicitation. You may also contact the department's SB/DVBE Advocate for assistance: www.parks.ca.gov/advocate.

b) Access the list of all certified SB/MBs by using the Department of General Services, Procurement Division (DGS-PD) online certified firm database at: www.Caleprocure.ca.gov

c) Search by "Keywords" or United Nations Standard Products and Services Codes (UNSPSC) that apply to the elements of work you want to subcontract to a SB/MB.

d) Check for subcontractor ads that may be placed on the California State Contracts Register (CSCR) for this solicitation prior to the closing date. You may access the CSCR at: www.Caleprocure.ca.gov

5. Information

The State of California, Department of General Services, Procurement Division, Office of Small Business and DVBE Services (OSDS) offers many services that assist contractor/business owners with a variety of information designed to streamline the State contracting process. OSDS also certifies SB/MB contractors. For more information, please contact

The State of California
Department of General Services
Office of Small Business and DVBE Services
707 Third Street, First Floor – Room 400
West Sacramento, CA 95605

www.dgs.ca.gov/PD/Contact
Receptionist: (916) 375-4940
24-hour recording: (916) 322-5060
FAX: (916) 375-4950
OSDSHelp@dgs.ca.gov

Disabled Veteran Business Enterprise (DVBE) Notice

DVBE Participation Requirement and Incentive for Invitation For Bids (IFB)

1. Bidder's attention is directed to the Disabled Veteran Business Enterprise (DVBE) Participation Requirement for bidders, as outlined in the accompanying bid package.

2. In order to be responsive and eligible for award of the contract, bidder must attain the prescribed goals for the DVBE participation.

The DVBE Participation Requirement for this solicitation is 6%.

Failure to fulfill the DVBE requirement will render your bid non-responsive.

3. It is essential that you commence the required participation process **immediately**, to allow adequate response time for potential DVBE participants.

4. The DVBE participation requirement is mandatory by state law, whether you are conducting business as an individual, partnership or corporation.

IMMEDIATE ACTION REQUIRED

5. What is a Disabled Veteran Business Enterprise (DVBE)?

a) For a business to be considered a Disabled Veteran Business Enterprise (DVBE), they must be certified with the State of California - Department of General Services in accordance with California Code of Regulations, Title 2, Section 1896.94. Please see the following website for more information about DVBE certification benefits and eligibility requirements:

www.dgs.ca.gov/PD/Services/Page-Content/Procurement-Division-Services-List-Folder/Certify-or-Re-apply-as-Small-Business-Disabled-Veteran-Business-Enterprise

b) Only DVBEs who perform a commercially useful function relevant to this solicitation, may be used to satisfy the DVBE participation and/or incentive program requirements.

6. Commercially Useful Function Definition

a) California Code of Regulations, Title 2, § 1896.61(l): The term "DVBE contractor, subcontractor or supplier" means any person or entity that satisfies the ownership (or management) and control requirements of §1896.61(f); is certified in accordance with §1896.70; and provides services or goods that contribute to the fulfillment of the contract requirements by performing a commercially useful function.

b) A person or entity must perform a commercially useful function (CUF) as defined under Military and Veterans Code (MVC) §999.

c) A contractor, subcontractor, or supplier will not be considered to perform a commercially useful function if the contractor's, subcontractor's, or supplier's role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to obtain the appearance of disabled veteran business enterprise participation.

7. What is the DVBE participation requirement?

a) **Bidders must commit at minimum 6% of their total bid** to currently certified and registered DVBE companies for this solicitation. All bidders must meet the full participation requirement based on the total bid amount in order to be considered a responsive bidder.

b) **Reporting Requirement:** *If, for this agreement and pursuant to Military & Veterans Code (MVC) 999.5 (d), a contractor made a commitment to achieve disabled veteran business enterprise (DVBE) participation, within 60 days of receiving final payment under this agreement (or within such other time period as may be specified elsewhere in this agreement) the contractor must certify in a report to the awarding department:*

1. *the total amount the prime contractor received under the contract*
2. *the name and address of the DVBE(s) that participated in the performance of the contract*
3. *the amount each DVBE received from the prime contractor*
4. *that all payments under the contract have been made to the DVBE(s)*
5. *the actual percentage of DVBE participation that was achieved*

c) *You will be required to report to DPR the actual dollars spent with each DVBE subcontractor on a STD. 817. If awarded the contract you will receive this form at the completion of the contract. A person or entity that knowingly provides false information shall be subject to a civil penalty for each violation. (Military & Veterans Code (M&VC) § 999.5(d))*

8. What is the DVBE Incentive Program?

a) The DVBE Incentive Program was established by statute and applies to contracts solely financed by State funds. This program is separate from the DVBE Participation Program. The incentive is designed to encourage bidders to partner with DVBE subcontractors.

b) DVBE incentive will be given to bidders who provide DVBE participation above 6%.

c) The incentive may be combined with other incentives and preferences up to an established cap of $100,000.00. **The incentive is used only for evaluation purposes and does not alter the amounts of the actual bids.**

9. Who is eligible to receive the incentive?

a) Any responsive bidder who has attained more than the required amount (6%) of DVBE participation per the solicitation instructions.

10. Documentation

a) To be considered a reponsive bidder, bidders must document at least 6% DVBE participation commitment by completing and submitting the following forms:
   1. GSPD 05-105, Bidder Declaration
   2. DGS PD 843, DVBE Declaration

b) GSPD 05-105, Bidder Declaration: The GSPD 05-105 is used to document the proposed prime contractor and subcontractors, including their roles and responsibilities. **The form must be submitted with the bid package.** If there is a discrepancy between the dollar amount and percentage of bid for DVBE participation then the percentage shall prevail.

c) DGS PD 843,DVBE Declaration: All disabled veteran owners and disabled veteran managers of the DVBE must complete the form and submit it with the bid package. A DGS PD 843 needs to be submitted by every DVBE supplier who is part of a bid whether they are the prime contractor or subcontractor .

d) Bids that fail to submit the completed required forms to confirm the level of DVBE participation will not be eligible to receive the DVBE incentive and may be declared unresponsive due to DVBE participation requirements. Clerical and typographical errors on these forms may be corrected at the State's sole discretion.

e) Information submitted by the bidders to claim the DVBE incentive(s) will be verified by the State. If evidence of an alleged violation is found during the verification process, the State shall initiate an investigation, in accordance with the requirements of the PCC §10115, et seq., and MVC §999 et seq., and follow the investigatory procedures required by the 2 CCR §1896.80. Contractors found to be in violation of certain provisions may be subject to loss of certification, penalties and/or contract termination.

11. How does the DVBE Incentive Program Work?

a) The DVBE incentive is used only for evaluation purposes to determine the successful bidder and does not alter the amounts of the actual bids. A dollar cap of $100,000.00 is set for all combined incentives and preferences.

b) For contracts to be awarded based on the Low Price Method, the incentive amount is equal to a percentage of the lowest responsive and responsible bid based on the amount of DVBE participation in the bid being evaluated per Table A below. The Computation Method does not include the small business preference; however, the small business preference may be applied and may affect the application of the incentive and the outcome of the ranking.

c) **Table A – Invitation For Bid (IFB)** (aka Low Price Method)

Confirmed DVBE Participation of	DVBE Incentive Amount for IFB
10% or more	5% of lowest responsive and responsible bid
9% - 9.99%	4% of lowest responsive and responsible bid
8% - 8.99%	3% of lowest responsive and responsible bid
7% - 7.99%	2% of lowest responsive and responsible bid
6.01% - 6.99%	1% of lowest responsive and responsible bid

d) **Computation Method**

Low Price Method

Bidder Name	A	B	C
Original Bid Price	$98,000.00	$102,100.00	$100,000.00
DVBE Participation for certified DVBE Prime or Subcontractors	4%	8%	6%
Initial Ranking	Unresponsive	2	1
DVBE Incentive (from Table A)	n/a	3%	n/a
Incentive Amount (% x Lowest Responsive and Responsible Bid Price)	n/a	**$3,000.00** (3% x $100,000)	n/a
Evaluated Bid Price (Bidder's Price - Bidder's Incentive Amount)	n/a	**$99,100.00** ($102,100 - $3,000)	n/a
Final Rank:	**Unresponsive**	**1**	**2**

12. Substitution of Proposed DVBE

a) If awarded the contract, the DVBE subcontractors and/or contractors proposed by bidder must be used unless prior written notice of substitution is provided to the state and the state approves such substitution.

b) The notice must include a minimum of: (1) a written explanation of the reason for the substitution; and (2) an updated GSPD 05-105 must be submitted to the award office of Department of Parks and Recreation. The substitution request must before approved before the substitution can take place.

c) Failure to adhere to at least the DVBE participation proposed by the successful bidder may be cause for contract termination and recovery of damages under the rights and remedies due the state under the default section of the contract.

d) Contractor understands and agrees that should award of this contract be based in part on their commitment to use the Disabled Veteran Business Enterprise (DVBE) subcontractor(s) identified in their bid or offer, per Military and Veterans Code 999.5 (e), a DVBE subcontractor may only be replaced by another DVBE subcontractor and must be approved by the State. Changes to the scope of work that impact the DVBE subcontractor(s) identified in the bid or offer and approved DVBE substitutions will be documented by contract amendment.

e) Failure of Contractor to seek substitution and adhere to the DVBE participation level identified in the bid or offer may be cause for contract termination, recovery of damages under rights and remedies due to the State, and penalties as outlined in M&VC § 999.9; Public Contract Code (PCC) § 10115.10, or PCC § 4110 (applies to public works only).

13. To locate DVBE contractors:

a) Contact the department's contracting official named in this solicitation for any DVBE contractors who may have identified themselves as potential subcontractors, and to obtain suggestions for search criteria to possibly identify DVBE contractors for the solicitation. You may also contact the department's SB/DVBE Advocate for assistance:

b) Access the list of all certified DVBEs by using the Department of General Services, Procurement Division (DGS-PD) online certified firm database at:

https://caleprocure.ca.gov/pages/PublicSearch/supplier-search.aspx?psNewWin=true

Search by "Keywords" or United Nations Standard Products and Services Codes (UNSPSC), that apply to the elements of work you want to subcontract to a DVBE.

c) Check for subcontractor ads that may be placed on the California State Contracts Register (CSCR) for this solicitation prior to the closing date. You may access the CSCR at:
www.Caleprocure.ca.gov

d) The State of California, Department of General Services (DGS), Procurement Division, Office of Small Business and DVBE Services (OSDS) offers many services that assist contractor/business owners with a variety of information designed to streamline the State contracting process. OSDS also certifies DVBE contractors. For more information, please

The State of California
Department of General Services
Office of Small Business and DVBE Services
707 Third Street, First Floor – Room 400
West Sacramento, CA 95605

www.dgs.ca.gov/PD
Receptionist: (916) 375-4940
24-hour recording: (916) 322-5060
FAX: (916) 375-4950
OSDSHelp@dgs.ca.gov

DISABLED VETERAN BUSINESS ENTERPRISE (DVBE)
DVBE Documentation Checklist

1. The State of California acknowledges the service and sacrifice of its disabled veterans, in part, through the "Disabled Veteran Business Enterprise (DVBE) Participation Program." As mandated by law, state agencies have a goal to award at least 3% of their annual contract dollars to certified DVBE's.

2. When a firm bids on a state DPR contract that contains DVBE participation, the the dollar amount of **the bid must meet the 6% participation requirement** set by DPR.

3. **INCOMPLETE DOCUMENTATION (GSPD 05-105 AND DGS PD 843) MUST RESULT IN DISQUALIFICATION FROM FURTHER PARTICIPATION IN THE SELECTION PROCESS FOR THE CONTRACT.**

4. The following checklist is provided to assist bidders with their DVBE participation documentation:

a) GSPD 05-105, Bidder Declaration

- ☐ All DVBE participation is indicated.
- ☐ The names of each participating DVBE company is listed with the dollar value and applied percentage of the bid.
- ☐ A copy of the printout from eProcurement system showing the company's DVBE certification status.
- ☐ The DVBE participation percentage listed agrees with the dollar value claimed.

b) DGS PD 843, DVBE Declaration

- ☐ A completed and signed DGS PD 843 is included with the bid for every DVBE (whether prime contractor or subcontractor) included.

State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PUBLIC WORKS
NOTICE TO CONTRACTORS

CASWELL MEMORIAL STATE PARK (SP)
Campground and Day Use Improvements
San Joaquin County, California
Bid Number: C26863031

Bids must be submitted electronically with all necessary fully executed bid submission documents as an attachment in Portable Document Format (PDF) to DPR.PWBIDS@parks.ca.gov no later than **2:00 p.m., Tuesday, November 24, 2026**. Bid submission time will be as of the electronic time stamp associated with when the electronic email submission was received. Submissions with attached PDF documents in excess of 10 Megabytes in size risk being rejected and can be deemed unresponsive. DPR will provide an individual electronic email response confirming receipt of each submission received. If a confirmation receipt is not received within 30-minutes of submission, please contract Merrilee Byrnes at Merrilee.Byrnes@parks.ca.gov to confirm your bid was received. Confirmation receipt is not a representation by DPR that the submitted bid is responsive and complete. Bidders shall ensure that the electronic submission contains the attachment, the documents are fully responsive and lack any deficiency and is directed to the appropriate email address (DPR.PWBIDS@parks.ca.gov) without error. Failure to do so risks the bid being deemed unresponsive. It is recommended that Bidders submit bids at least an hour in advance of the bid submission deadline to allow for confirmation of bid submission. Bid will be opened publicly over conference-call, individuals interested in calling into the conference must send their request into DPR.PWBIDS@parks.ca.gov to receive a conference participation access code. Please ensure a request for conference-call is submitted 24-hours in advance to allow DRP adequate time to accommodate all Bidders. Bids will be submitted for performing the work as follows:

> Furnish all labor, materials, tools and equipment necessary to upgrade the campground and day use areas at **CASWELL MEMORIAL SP** in San Joaquin County, California, complete and in accordance with the plans and specifications therefore and such addenda thereto as may be issued prior to bid opening date.

License required: **A and/or B**

Engineer's Estimate: **$4,200,000 to $5,800,000**

Contract Term: **730 Calendar Days from Notice to Proceed**
Work Performance Period**: 365 Calendar Days from Formal Start Work Date**

NOTE: **A job showing will be held at 1:00 p.m., Monday, November 9, 2026, at CASWELL MEMORIAL SP, Group Camp Parking Lot, 28000 S. Austin Rd. Ripon CA 95366 in San Joaquin County. Attendance at the job showing is MANDATORY and will be the only opportunity made available for prospective bidders to view the site with park personnel. No Bid will be**

considered from a Prime Contractor that did not attend the mandatory job showing.

The bidder agrees to complete all work within **THREE HUNDRED SIXTY-FIVE (365)** calendar days from the date of written notice to commence work. This time includes ten (10) calendar days allowed for the contractor to begin work.

Instructions to Download Bid Package: Prospective bidders may examine and obtain the bid forms, specifications, plans and addenda (if any) by downloading this bid package from the Department of General Services' (DGS) website at: **https://caleprocure.ca.gov/pages/Events-BS3/event-search.aspx.** At the website go to Quicklinks, Find Bid Opportunities, and enter Bid Number "**C26863031**" in the "Event Name" field. Click on the "Search" button to view the full advertisement and bid documents.

Questions and Answers: Any discrepancies, omissions, ambiguities, or conflicts in or among the contract documents or doubts as to meaning shall be brought to the State's attention by including your comments directly to Merrilee.Byrnes@parks.ca.gov **NO LATER THAN 2 p.m., seven (7)** calendar days prior to bid opening date. Answers will be provided by Addendum which will be posted within the Bid Solicitation located on the Cal eProcure website stated above. It is the responsibility of the bidders to download any addenda as needed.

No bid will be considered unless it is made on a standard bid form furnished by the Department of Parks and Recreation, and is made in accordance with the "Instructions to Bidders".

Bids must be submitted for the entire work as described herein. The Department of Parks and Recreation reserves the right to waive any irregularity in a bid or to reject any or all bids.

The apparent low bidder will be required to execute a contractual agreement in the form of a "Standard Agreement - Form 213" which shall be binding upon the State of California only upon approval by the State.

Payment and Performance Bond requirements are stated in the General Conditions, DPR 483, Section 000700.

In accordance with the provisions of Section 1770, 1773 and 1773.1 of the Labor Code, the Department has ascertained that the general prevailing rate of wages in the county in which the work to be done be as listed by the Department of Industrial Relations (415) 703-4780. A copy of this listing is on file at the address listed above or at www.dir.ca.gov**.**

Participation in Small Business Preference Program: Preference will be granted to bidder properly approved as "Small Business" in accordance with Section 1896, et seq., Title 2, California Code of Regulations. A small business firm must have an approved certification form (STD. 812) on file at the Department of General Services, Office of Small Business and DVBE Services, 707 Third Street, First Floor – Room 400, West Sacramento, California 95605, by 5:00 p.m. of bid opening date (website address:

http://www.pd.dgs.ca.gov/smbus). If bidder requests "Small Business" preference on this project, bidder must sign STD. 811 form (Small Business Preference and Certification Request) and submit with bid. A printout from the eProcurement website www.caleprocure.ca.gov showing Small Business Certification and expiration date must be submitted with bid.

Non-Small Business Preference – refer to **"**Bidder Declaration," GSPD 05-105 form: A five percent (5%) bid preference is available to a non-small business proposing firms claiming twenty-five percent (25%) California certified small business subcontractor participation. If claiming the non-small business subcontractor preference, follow the directions and fill out the "Bidder Declaration" (GSPD 05-105) which is included in the Bid Forms. Proposers claiming the five percent (5%) preference must commit to subcontract at least twenty-five percent (25%) of the net bid price with one or more California certified small businesses. Completed certification applications and required support documents must be submitted to the office of Small Business and DVBE Services (OSDS) no later than 5:00 p.m. on the bid due date, and the OSDS must be able to approve the application as submitted. Questions regarding certification should be directed to the OSDS at (916) 375-4940.

Participation in Disabled Veteran Business Enterprise Program (DVBE): The **minimum** DVBE participation percentage goal is **6%**. Failure to fulfill the DVBE requirement will render your bid non-responsive. **DVBE Incentive:** For evaluation purposes only, an incentive will be given to bidders who exceed 6% DVBE participation requirements. Refer to the DVBE forms beginning with DPR 479IP. In determining the lowest responsible bidder, the SB Preference is applied first in the bid evaluation process. If the Low Bidder is claiming the SB Preference or the Non-Certified SB Preference, the 5% or $50,000 max is not calculated for any bidder. However, the DVBE Incentive would be calculated. A Low Bidder claiming the SB Preference can only be displaced by another bidder claiming the SB Preference, if the adjusted bid price with SB Preference and DVBE Incentive is lower. The DVBE program incentives are applied second for bidders attaining more than the required amount of DVBE participation per the solicitation instructions. More information regarding the incentive program(s) and how bids are evaluated is available on the State Administrative Manual Management Memo Number MM08-03 (Management Memo) at http://www.documents.CaleProcure.ca.gov/osp/sam/mmemos/MM08_03.pdf.

Notice of Requirement for Nondiscrimination Program: Your attention is called to the "Nondiscrimination Clause" set forth or referred to herein, which is applicable to all nonexempt State construction contracts, and subcontracts, and to the "Standard California Nondiscrimination Construction Contract Specifications" set forth herein. (Refer to General Terms and Conditions (GTC 02/2025) at http://www.CaleProcure.ca.gov/ols/Resources/StandardContractLanguage.aspx).

Withdrawal of Bid: As stated in the Instructions to Bidders, any requests to withdraw a bid must be submitted in writing. Submit via email to PWBids@parks.ca.gov. See Instructions to Bidders, section 1.03M for details.

Public Works Contractor Registration Program – SB 854: 1) No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on

or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)]. 2) No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. 3) This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. Refer to http://www.dir.ca.gov/Public-Works/SB854.html for more information.

Executive Order N-6-22 – Russia Sanctions
On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (the EO) regarding Economic Sanctions against Russia and Russian entities and individuals. "Economic Sanctions" refers to sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. By submitting a bid or proposal, Contractor represents that it is not a target of Economic Sanctions. Should the State determine Contractor is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for rejection of the Contractor's bid/proposal any time prior to contract execution, or, if determined after contract execution, shall be grounds for termination by the State.

Gen AI solicitation language
The State of California seeks to realize the potential benefits of GenAI, through the development and deployment of GenAI tools, while balancing the risks of these new technologies.

Bidder / Offeror must notify the State in writing if it: (1) intends to provide GenAI as a deliverable to the State; or (2), intends to utilize GenAI, including GenAI from third parties, to complete all or a portion of any deliverable that materially impacts: (i) functionality of a State system, (ii) risk to the State, or (iii) Contract performance. For avoidance of doubt, the term "materially impacts" shall have the meaning set forth in State Administrative Manual (SAM) § 4986.2 Definitions for GenAI.

Failure to report GenAI to the State may result in disqualification. The State reserves the right to seek any and all relief to which it may be entitled to as a result of such nondisclosure.

Upon notification by a Bidder / Offeror of GenAI as required, the State reserves the right to incorporate GenAI Special Provisions into the final contract or reject bids/offers that present an unacceptable level of risk to the State.

Government Code 11549.64 defines "Generative Artificial Intelligence (GenAI)" as an artificial intelligence system that can generate derived synthetic content, including text, images, video, and audio that emulates the structure and characteristics of the system's training data.

DEPARTMENT OF PARKS AND RECREATION
Armando Quintero, Director

SECTION 00100
PUBLIC WORKS
INSTRUCTIONS TO BIDDERS

PART 1. GENERAL

1.01 EXAMINATION OF BID DOCUMENTS AND SITE

A. *Bidder shall carefully examine and thoroughly acquaint himself/herself with the conditions at the site of the work, the plans, the specifications and the provisions contained in the project manual. He/she shall investigate conditions character, quality and quantity of surface, and sub-surface materials of obstacles to be encountered. Failure by the bidder to acquaint himself/herself with site conditions and available information will not relieve him/her from the responsibility for estimating properly the difficulty or cost of successfully performing the work. The submission of a bid will be considered as conclusive evidence that the bidder has made such examination.*

B. Questions pertaining to the Plans and Specifications which may arise during the bidding period shall be directed to the Question and Answer section of the solicitation posted within the advertisement.

1.02 DISCREPANCIES

A. Any discrepancies, omissions, ambiguities, or conflicts in or among the contract documents or doubts as to meaning shall be brought to the state's attention not later than seven days prior to bid opening date.

B. All interpretations and clarifications will be in the form of written addenda. All bidders are responsible to inquire as to addenda issued. All addenda become part of the contract documents. Any oral representations issued shall be of no force or effect.

1.03 BIDS AND BIDDERS

A. Before submitting bids, all bidders must be licensed in the appropriate classification in accordance with provisions in Chapter 9, Division 3, of the "California Business and Professions Code" as amended.

No bidder may bid on work of a kind for which he/she is not properly licensed by the Contractors State License Board, and any such bid received will be rejected. Joint venture bidders must possess a joint venture license.

B. State shall not award a contract to a bidder, nor shall a bidder be eligible to bid for or receive a contract, who has, in the preceding five years, been convicted of violating a state or federal law respecting the employment of undocumented aliens.

C. Bids shall be signed and submitted on the Bid Form provided and shall be filled out in the same name style, manner and license number as bidder is licensed with the Contractors State License Board.

D. Each bid shall have listed therein the name, address, license number and portion of the work of each subcontractor to whom the bidder proposes to subcontract portions of the work in an amount in excess of 1/2 of 1 percent of the total bid in accordance with the "Subletting and Subcontracting Fair Practices Act," commencing with Section 4100 of the Public Contract Code. The contractor agrees that he/she is fully qualified to perform that portion of the work, and that he/she shall perform that portion of the work for which a subcontractor has not been listed.

E. Bids exceeding $5,000 shall have enclosed cash, a cashier's check, certified check, or a bidder's bond, executed as surety by a corporation authorized to issue surety bonds in the State of California, made payable to "Director of Parks and Recreation," in an amount equal to at least 10 percent of amount of bid. No such bid shall be considered unless one of the forms of bidder's security is enclosed therewith. If bidder's security is a bidder's bond, it must be executed on a form approved by the state. Personal checks are not acceptable.

Within 10 days after the contract award the Department of Parks and Recreation will return all bidder's security, other than bidder's bonds, accompanying proposals that are not to be further considered in making the award. Retained bidder's security will be held until the contract has been fully executed, after which all bidder's security, except bidder's bonds, will be returned.

F. Bids shall not be qualified. Any proposal modifying the conditions of the bid will be disregarded, or will be cause for rejection of the bid. Deviations from the Plans and Specifications shall not be considered and shall be cause for rejection of the bid.

G. Bids shall include the cost of all items shown on the Plans, mentioned in the Specifications, or reasonably inferred therefrom as necessary to complete the work within the intent of the contract documents.

H. Bid shall include all applicable federal, state and other taxes, together with the cost of all permits, licenses and the like, which may be required under various laws and regulations.

I. Amounts shall be written in figures.

J. Bids shall be submitted electronically in Portable Document Format (PDF) to DPR.PWBIDS@parks.ca.gov no later than the time and date determined in the Notice to Contractors. If confirmation receipt of your bid submission is not received within 30-minutes, please contract Merrilee Byrnes at Merrilee.Byrnes@parks.ca.gov to confirm your bid has been received. It is recommended Bidders submit their bids at least one (1) hour in advance of the bid submission deadline to allow for confirmation of bid submission; however, it is the responsibility of the bidder to see that his/her bid is received in the proper time. Bids will be opened publicly over conference-call, upon request of Bidder(s). Please ensure a request for conference-call of bid opening is submitted 24-hours in advance to allow DPR adequate time to accommodate all Bidders. Neither confirmation receipt nor announcement of bid implicates responsiveness of Any bid. DPR will determine responsiveness of all bids after completion of bid reviews.

K. No bids will be accepted after the time set for the bid opening.

L. Bids will be opened and read publicly at the time set for the bid opening, or as soon as practicable thereafter.

M. Any bid may be withdrawn prior to the time fixed in the Notice to Contractors for submitting bids, provided a request for withdrawal is submitted in writing, signed by the bidder or his duly authorized representative and filed at, or e-mailed to or faxed to the place shown on the Notice to Contractors. *An oral, telegraphic, or telephonic request to withdraw or alter a bid proposal is not acceptable.*

N. No bid may be withdrawn after the time fixed in the Notice to Contractors for submitting bids.

O. No bids shall be considered unless a sworn statement is executed by the bidder on the form provided by the state titled "NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS," DPR 837, and submitted with the bid.

P. In the case of a tie bid, the determination of a successful bidder will be made by a coin toss in the presence of all interested bidders, at a time and date set by the state.

1.04 CONTRACT

A. **Bids shall remain valid for 120 calendar days after the bid opening date ("120-Day Bid Validity Period"):** The State will endeavor to award a contract within 120 calendar days from the bid opening date. A contract is awarded upon the State providing written notifications to a bidder that it is the lowest responsible bidder and forwarding the contract documents to such bidder for bidder's signature. A contract is executed upon the State agency with approcal authority approving the contract. Bidders shall honor their bids for 120 calendar days after the bid opening date. If after 120 calendar days from the bid opening date a bidder has not received written notification from the State that bidder has been awarded the contract, such bidder may withdraw their bid. If within the 120-Day Bid Validity Period, a bidder receives written notification from the State that such bidder has been awarded the contract, such bidder shall continue to honor its bid and have no claim for any reason to amend its bid pending execution of the contract.

B. If the contract is awarded, it will be awarded to lowest responsible bidder whose bid complies with all prescribed requirements, which may include a “Small Business Vendor” in accordance with California Code of Regulations, Title 2, Section 1896 et seq.

C. The apparent low bidder, in order to qualify as the lowest responsible bidder, will be required to execute and deliver to the State the rquired contract documents.

D. The apparent low bidder shall execute the required number of copies of the contract documents and return them within ten (10) working days, not including Saturdays, Sundays and Legal Holidays, after he/she has received notice that he/she is the apparent low bidder. Signature of the apparent low bidder on the contract documents will complete identification of these documents.

Failure to provide the required executed contract documents within the ten (10) working days, not including Saturdays, Sundays and Legal Holidays may be deemed refusal of an award which may be cause for forfeiture of bidder’s security.

The state may award to the next lowest responsible bidder and avail itself of all legal remedies provided by statute.

E. The contract shall be binding upon the state only after approval by the state. Should work begin in advance of receiving notice that the Contract is approved, that work shall be considered as having been done by a volunteer and Contractor shall go unpaid.

1.05 CERTIFICATE OF INSURANCE

The contractor shall furnish a Certificate of Insurance to the state as described in General Conditions, DPR 483, Section 00700.

1.06 CALIFORNIA PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE

Bidder shall be required to submit a DPR 20 (California Public Contract Code Section 10162 Questionnaire). Failure to submit this form with the bid shall not be cause for rejection; however, bidders must furnish the completed form within the time frame prescribed by the Department of Parks and Recreation. Failure to submit the required information within the time frame prescribed by the Department of Parks and Recreation may be deemed refusal of an award which shall be cause for forfeiture of bidder’s security.

Solicitation Number_____

BIDDER DECLARATION

1. Prime bidder information **(Review attached Bidder Declaration Instructions prior to completion of this form)**:

a. Identify current California certification(s) **(MB, SB, NVSA, DVBE):** _____ **or None** ☐ (If "None", go to Item #2)

b. Will subcontractors be used for this contract? **Yes** ☐ **No** ☐ (If yes, indicate the distinct element of work your firm will perform in this contract e.g., list the proposed products produced by your firm, state if your firm owns the transportation vehicles that will deliver the products to the State, identify which solicited services your firm will perform, etc.). Use additional sheets, as necessary.

SAMPLE

c. If you are a California certified DVBE:
(1) Are you a broker or agent? **Yes** ☐ **No** ☐
(2) If the contract includes equipment rental, does your company own at least 51% of the equipment provided in this contract (quantity and value)? **Yes** ☐ **No** ☐ **N/A** ☐

2. If no subcontractors will be used, skip to certification below. Otherwise, list all subcontractors for this contract. (Attach additional pages if necessary):

Subcontractor Name, Contact Person, Phone Number & Fax Number	Subcontractor Address & Email Address	CA Certification (MB, SB, NVSA, DVBE or None)	Work performed or goods provided for this contract	Corresponding % of bid price	Good Standing?	51% Rental?
					☐	☐
					☐	☐
					☐	☐

CERTIFICATION: By signing the bid response, I certify under penalty of perjury that the information provided is true and correct.

BIDDER DECLARATION Instructions

All prime bidders (the firm submitting the bid) must complete the Bidder Declaration.

1.a. Identify all current certifications issued by the State of California. If the prime bidder has no California certification(s), check the line labeled "None" and proceed to Item #2. If the prime bidder possesses one or more of the following certifications, enter the applicable certification(s) on the line:

- Microbusiness (MB)
- Small Business (SB)
- Nonprofit Veteran Service Agency (NVSA)
- Disabled Veteran Business Enterprise (DVBE)

1.b. Mark either "Yes" or "No" to identify whether subcontractors will be used for the contract. If the response is "No", proceed to Item #1.c. If "Yes", enter on the line the distinct element of work contained in the contract to be performed or the goods to be provided by the prime bidder. Do not include goods or services to be provided by subcontractors.

Bidders certified as MB, SB, NVSA, and/or DVBE must provide a commercially useful function as defined in Military and Veterans Code Section 999 for DVBEs and Government Code Section 14837(d)(4)(A) for small/microbusinesses.

Bids must propose that certified bidders provide a commercially useful function for the resulting contract or the bid will be deemed non-responsive and rejected by the State. For questions regarding the solicitation, contact the procurement official identified in the solicitation.

Note: A subcontractor is any person, firm, corporation, or organization contracting to perform part of the prime's contract.

1.c. This item is only to be completed by businesses certified by California as a DVBE.

(1) Declare whether the prime bidder is a broker or agent by marking either "Yes" or "No". The Military and Veterans Code Section 999.2 (b) defines "broker" or "agent" as a certified DVBE contractor or subcontractor that does not have title, possession, control, and risk of loss of materials, supplies, services, or equipment provided to an awarding department, unless one or more of the disabled veteran owners has at least 51-percent ownership of the quantity and value of the materials, supplies, services, and of each piece of equipment provided under the contract.

(2) If bidding rental equipment, mark either "Yes" or "No" to identify if the prime bidder owns at least 51% of the equipment provided (quantity and value). If **not** bidding rental equipment, mark "N/A" for "not applicable."

---

2. If no subcontractors are proposed, do not complete the table. Read the certification at the bottom of the form and complete "Page ____ of ____" on the form.

If subcontractors will be used, complete the table listing all subcontractors. If necessary, attach additional pages and complete the "Page ____ of ____" accordingly.

2. *(continued)* **Column Labels**

Subcontractor Name, Contact Person, Phone Number & Fax Number—List each element for all subcontractors.

Subcontractor Address & Email Address—Enter the address and if available, an Email address.

CA Certification (MB, SB, NVSA, DVBE or None)—If the subcontractor possesses a current State of California certification(s), verify on this website (www.eprocure.pd.dgs.ca.gov).

Work performed or goods provided for this contract—Identify the distinct element of work contained in the contract to be performed or the goods to be provided by each subcontractor. Certified subcontractors must provide a commercially useful function for the contract. (See paragraph 1.b above for code citations regarding the definition of commercially useful function.) If a certified subcontractor is further subcontracting a greater portion of the work or goods provided for the resulting contract than would be expected by normal industry practices, attach a separate sheet of paper explaining the situation.

Corresponding % of bid price—Enter the corresponding percentage of the total bid price for the goods and/or services to be provided by each subcontractor. Do not enter a dollar amount.

Good Standing?—Provide a response for each subcontractor listed. Enter either "Yes" or "No" to indicate that the prime bidder has verified that the subcontractor(s) is in good standing for all of the following:

- Possesses valid license(s) for any license(s) or permits required by the solicitation or by law
- If a corporation, the company is qualified to do business in California and designated by the State of California Secretary of State to be in good standing
- Possesses valid State of California certification(s) if claiming MB, SB, NVSA, and/or DVBE status

51% Rental?—This pertains to the applicability of rental equipment. Based on the following parameters, enter either "N/A" (not applicable), "Yes" or "No" for each subcontractor listed.

Enter "**N/A**" if the:

- Subcontractor is NOT a DVBE (regardless of whether or not rental equipment is provided by the subcontractor) or
- Subcontractor is NOT providing rental equipment (regardless of whether or not subcontractor is a DVBE)

Enter "**Yes**" if the subcontractor is a California certified DVBE providing rental equipment and the subcontractor owns at least 51% of the rental equipment (quantity and value) it will be providing for the contract.

Enter "**No**" if the subcontractor is a California certified DVBE providing rental equipment but the subcontractor does NOT own at least 51% of the rental equipment (quantity and value) it will be providing.

Read the certification at the bottom of the page and complete the "Page ____ of ____" accordingly.

SAMPLE

STATE OF CALIFORNIA – DEPARTMENT OF GENERAL SERVICES PROCUREMENT DIVISION

DISABLED VETERAN BUSINESS ENTERPRISE DECLARATIONS

DGS PD 843 (Rev. 9/2019)
Formerly STD. 843

Instructions: The disabled veteran (DV) owner(s) and DV manager(s) of the Disabled Veteran Business Enterprise (DVBE) must complete this declaration when a DVBE contractor or subcontractor will provide materials, supplies, services or equipment [Military and Veterans Code Section 999.2]. Violations are misdemeanors and punishable by imprisonment or fine and violators are liable for civil penalties. All signatures are made under penalty of perjury.

SECTION 1

Name of certified DVBE: _____ DVBE Ref. Number: _____

Description (materials/supplies/services/equipment proposed): _____

Solicitation/Contract Number: _____ SCPRS Ref. Number: _____
(FOR STATE USE ONLY)

SECTION 2

APPLIES TO ALL DVBEs. Check only one box in Section 2 and provide original signatures.

☐ I (we) declare that the DVBE is not a broker or agent, as defined in Military and Veterans Code Section 999.2 (b), of materials, supplies, services or equipment listed above. Also, complete Section 3 below if renting equipment.

☐ Pursuant to Military and Veterans Code Section 999.2 (f), I (we) declare that the DVBE is a broker or agent for the principal(s) listed below or on an attached sheet(s). *(Pursuant to Military and Veterans Code 999.2 (e), State funds expended for equipment rented from equipment brokers pursuant to contracts awarded under this section shall not be credited toward the 3-percent DVBE participation goal.)*

SAMPLE

All DV owners and managers of the DVBE **(attach additional pages with sufficient signature blocks for each person to sign)**:

_____ _____ _____
(Printed Name of DV Owner/Manager) (Signature of DV Owner/ Manager) (Date Signed)

_____ _____ _____
(Printed Name of DV Owner/Manager) (Signature of DV Owner/Manager) (Date Signed)

Firm/Principal for whom the DVBE is acting as a broker or agent: _____
(If more than one firm, list on extra sheets.) (Print or Type Name)

Firm/Principal Phone: _____ Address: _____

SECTION 3

APPLIES TO ALL DVBEs THAT RENT EQUIPMENT AND DECLARE THE DVBE IS NOT A BROKER.

☐ Pursuant to Military and Veterans Code Section 999.2 (c), (d) and (g), I am (we are) the DV(s) with at least 51% ownership of the DVBE, or a DV manager(s) of the DVBE. The DVBE maintains certification requirements in accordance with Military and Veterans Code Section 999 et. seq.

☐ The undersigned owner(s) own(s) at least 51% of the quantity and value of each piece of equipment that will be rented for use in the contract identified above. I (we), the DV owners of the equipment, have submitted to the administering agency my (our) personal federal tax return(s) at time of certification and annually thereafter as defined in *Military and Veterans Code 999.2,* subsections (c) and (g). *Failure by the disabled veteran equipment owner(s) to submit their personal federal tax return(s) to the administering agency as defined in Military and Veterans Code 999.2, subsections (c) and (g), will result in the DVBE being deemed an equipment broker.*

Disabled Veteran Owner(s) of the DVBE **(attach additional pages with signature blocks for each person to sign)**:

_____ _____
(Printed Name) (Signature) (Date Signed)

_____ _____ _____
(Address of Owner) (Telephone) (Tax Identification Number of Owner)

Disabled Veteran Manager(s) of the DVBE **(attach additional pages with sufficient signature blocks for each person to sign)**:

_____ _____ _____
(Printed Name of DV Manager) (Signature of DV Manager) (Date Signed)

PRINT CLEAR

State of California – Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

COMMERCIALLY USEFUL FUNCTION – BIDDER CERTIFICATION

All California Certified Small Business (SB), Micro Business (MB), and Disabled Veteran Business Enterprise (DVBE) suppliers contracting and subcontracting must complete this certification form.

LEGAL BUSINESS NAME (including "Doing Business As" DBA name)	DPR REFERENCE/AGREEMENT NUMBER

CERTIFICATIONS (mark all that apply)	DGS CERTIFICATION NUMBER (OSDS)	EXPIRATION DATE
☐ Small Business ☐ Micro Business ☐ DVBE		

For this agreement, this business is the: ☐ Prime Contractor ☐ Subcontractor

All Certified Small Business, Micro Business, and/or DVBE prime contractors, subcontractors or suppliers must meet the commercially useful function requirements under Government Code Section 14837(d)(4)(A) for Small and Micro Businesses, and Military and Veterans Code Section 999(b)(5)(B)(i) for DVBEs.

SAMPLE

A. Is the GSPD-05-105, Bidder Declaration attached? ☐ Yes ☐ No

B. Is the DGS PD 843, Disabled Veteran Business Enterprise Declarations form attached if applicable?

☐ Yes ☐ No ☐ N/A

Please answer the following 5 questions as they apply to your company for the goods and/or services being acquired in this solicitation:

1	Will your business be responsible for the execution of a distinct element of the resulting work?	☐ Yes ☐ No	
2	Will your business carry out the obligation of the contract by actually performing, managing or supervising the work involved?	☐ Yes ☐ No	
3	Will you perform work that is normal for your business, service and functions?	☐ Yes ☐ No	
4	Will your business be responsible for products, inventories, materials, suppliers required for the contract, negotiating price, determining quality and quantity, ordering, installing (if applicable) and making payment? (Note: This only applies to GOODS. If this is a service, mark N/A and skip to #5.)	**Goods** ☐ Yes ☐ No	**Services** ☐ N/A
5	If subcontracting a portion of the work, is it a normal portion as expected by current industry practices? (Also answer Yes if not subcontracting any portion.)	☐ Yes ☐ No	

A response of "No" may result in your quote being deemed non-responsive and disqualified.

BIDDER'S CERTIFICATION

The signatory of this document must be the certified business owner (or authorized representative in the case of a corporation) and as such, hereby certifies under penalty of perjury under the laws of the State of California that all information provided herein is truthful and accurate.

PRINTED NAME AND TITLE OF AUTHORIZED SIGNER	SIGNATURE	DATE

DEPARTMENT OF PARKS AND RECREATION USE

☐ APPROVED ☐ DENIED

DPR BUYER/EVALUATOR PRINTED NAME	SIGNATURE	DATE

State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

NON-COLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS

The undersigned declares:

I am the_____ of _____, the party
(Position Title) (Company Name)
making the foregoing bid.

SAMPLE

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 andnot 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 elementof 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 thatthe foregoing is true and correct, and that this declaration is executed on

_____, at _____, _____
(Date) (City) (State/Zip Code)

_____
(Print or Type Name)

_____
(Signature)

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

BIDDER'S BOND

KNOW ALL PEOPLE BY THESE PRESENTS:

That we, _____

_____, as Principal, and as Surety, are held and firmly bound unto the State of California, hereinafter called the State, in the penal sum of ten percent (10%) of the total amount of the bid of the Principal above named, submitted by said Principal to the State of California, Department of Parks and Recreation for the work described below, for the payment of which sum in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION of this obligation is such that:

WHEREAS, the Principal has submitted the above-mentioned bid to the State of California, Department of Parks and Recreation, for certain construction specifically described as follows, for which bids are to be opened at

_____

(Insert place where bids will be opened)

_____ on _____

(Insert date of bid opening)

for _____

(Copy here the exact description of work, including location, as it appears on the proposal)

_____

SAMPLE

NOW, THEREFORE, If the aforesaid Principal is awarded the contract and, within the time and manner required under the specifications, after the prescribed forms are presented to him or her for signature, enters into a written contract, in the prescribed form, in accordance with the bid, and files the two bonds with the Department, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by law, then this obligation shall be null and void; otherwise, it shall be and remain in full force and virtue.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including a reasonable attorney's fee to be fixed by the court.

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this _____ day of _____, 20 _____.

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

Principal

_____ (SEAL)

_____ (SEAL)

_____ (SEAL)

Surety

NOTE: Signatures of those executing for the Surety must be properly acknowledged.

CERTIFICATE OF ACKNOWLEDGEMENT

State of California

County of _____ ss

On this _____ day of _____ in the year of 20 _____ before me, a notary public in and for the county and state aforesaid, personally appeared, _____
known to me to be the person whose name is subscribed to the within instrument and known to me to be the attorney-in-fact of _____ and acknowledged to me that he subscribed the name of the said company thereto as surety, and his own name as attorney-in-fact.

(SEAL)

_____

Notary Public

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

CALIFORNIA PUBLIC CONTRACT CODE SECTION 10162
— Questionnaire —

PARK UNIT NAME	PROJECT NAME

NAME OF BUSINESS

In accordance with Section 10162 of the California Public Contract Code, bidders shall complete, under penalty of perjury, the question below. Please answer the following:

HAVE YOU, ANY OFFICER OF YOUR BUSINESS, OR ANY EMPLOYEE OF YOUR BUSINESS WHO HAS PROPRIETARY INTEREST IN YOUR BUSINESS EVER BEEN DISQUALIFIED, REMOVED, OR OTHERWISE PREVENTED FROM BIDDING ON, OR COMPLETING A FEDERAL, STATE, OR LOCAL GOVERNMENT PROJECT BECAUSE OF A VIOLATION OF LAW OR VIOLATION OF SAFETY REGULATIONS?

☐ **Yes** *(Explain circumstances below. Attach additional pages if needed.)* ☐ **No**

SAMPLE

NOTICE TO BIDDERS

Bidders are cautioned that making false certification may subject the certifier to criminal prosecution.

The Department of Parks and Recreation (DPR) reserves the right under California Public Contract Code Section 10162 to reject any bidder, any officer of such bidder, or any employee of such bidder who has a proprietary interest in such bidder who has been disqualified, removed or otherwise prevented from bidding on, or completing a federal, state or local government project because of a violation of law or violation of safety regulations.

Failure to return this form with the bid shall not be cause for rejection; however, bidders must furnish the completed form within the time frame prescribed by the DPR. Failure to submit this form within the time frame prescribed by the DPR may be deemed refusal of an award which shall be cause for forfeiture of bidder's security.

CERTIFICATION

By my signature, I certify under penalty of perjury under the laws of the State of California that the foregoing questionnaire and statements pursuant to California Public Contract Code Section 10162 are true and correct.

BIDDER SIGNATURE PRINTED NAME DATE

▶

State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

FOR DEPARTMENT USE ONLY
AGREEMENT/PAPO NO.

DARFUR CONTRACTING ACT CERTIFICATION

DO NOT COMPLETE OR RETURN THIS FORM IF: Within the previous three years, your company **HAS NOT** had any business activities or other operations outside of the United States.

All other companies, complete Option #1 or Option #2 and return:

Public Contract Code Sections 10475 -10481 applies to any company that currently or within the previous three years has had business activities or other operations outside of the United States. For such a company to bid on or submit a proposal for a State of California contract, the company must certify that it is either a) not a scrutinized company; or b) a scrutinized company that has been granted permission by the Department of General Services to submit a proposal.

SAMPLE

OPTION #1 - CERTIFICATION

If your company, within the previous three years, has had business activities or other operations outside of the United States, in order to be eligible to submit a bid or proposal, please insert your company name and Federal ID Number and complete the certification below.

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that a) the prospective proposer/bidder named below is not a scrutinized company per Public Contract Code 10476; and b) I am duly authorized to legally bind the prospective proposer/bidder named below. This certification is made under the laws of the State of California.

COMPANY/VENDOR NAME *(Printed)*	FEDERAL ID NUMBER
BY *(Authorized Signature)* ►	
PRINTED NAME AND TITLE OF PERSON SIGNING	
DATE EXECUTED	EXECUTED IN THE COUNTY AND STATE OF

OPTION #2 - WRITTEN PERMISSION FROM DGS

Pursuant to Public Contract Code section 10477(b), the Director of the Department of General Services may permit a scrutinized company, on a case-by-case basis, to bid on or submit a proposal for a contract with a state agency for goods or services, if it is in the best interests of the state. If you are a scrutinized company that has obtained written permission from the DGS to submit a bid or proposal, complete the information below.

We are a scrutinized company as defined in Public Contract Code section 10476, but we have received written permission from the Department of General Services to submit a bid or proposal pursuant to Public Contract Code section 10477(b). A copy of the written permission from DGS is included with our bid or proposal.

COMPANY/VENDOR NAME *(Printed)*	FEDERAL ID NUMBER
INITIALS OF SUBMITTER	
PRINTED NAME AND TITLE OF PERSON INITIALING	

DO NOT COMPLETE THIS FORM UNLESS YOUR COMPANY MEETS THE CRITERIA OF OPTION #1 OR OPTION #2.

FAIR CHANCE EMPLOYMENT ACT

Public Contract Code 10186:

(a) This section shall be known, and may be cited, as the "Fair Chance Employment Act."

(b) Any person submitting a bid to the state on a contract involving onsite construction-related services shall certify that the person will not ask an applicant for onsite construction-related employment to disclose orally or in writing information concerning the conviction history of the applicant on or at the time of an initial employment application.

(c) This section shall not apply to a position for which the person or the state is otherwise required by state or federal law to conduct a conviction history background check or to any contract position with a criminal justice agency, as that term is defined in Section 13101 of the Penal Code.

(d) This section shall not apply to a person to the extent that he or she obtains workers from a hiring hall pursuant to a bona fide collective bargaining agreement.

SAMPLE

CERTIFICATION

By my signature, I certify under penalty of perjury under the laws of the State of California that I have read, understand and will abide by California Public Contract Code Section 10186.

Contractor/Bidder Firm Name (Printed)	*Federal ID Number*
By (Authorized Bidders Signature)	
Printed Name and Title of Person Signing	
Date Executed	*Executed in the County of*

State of California – Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

ARTIFICIAL INTELLIGENCE (AI) DISCLOSURE FORM

Instructions for this form are on Page 3.

I. BIDDER CONTACT INFORMATION

BUSINESS NAME | SOLICITATION NUMBER

REPRESENTATIVE NAME | BUSINESS TELEPHONE NUMBER

BUSINESS ADDRESS | CITY | STATE | ZIP CODE

SAMPLE

Description of Services:

Describe in detail the services being provided. Include names of products and large language model.

II. DISCLOSURE

Will you and/or your subcontractor(s) be using or offering AI technology, model, service, or system (collectively, "product") for this product in question?

☐ No. (Skip to Section IIII) ☐ Yes. (Answer 1-5 below)

1. What type of AI is included?

☐ Traditional AI ☐ Generative AI

2. Is the AI required for this product?

☐ No ☐ Yes ☐ Other:

3. What is the model and version of this product?

4. What is the license tier of the AI product, if applicable (free, enterprise, platinum, etc.)?

SAMPLE

5. How is the AI solution delivered: IaaS, PaaS, SaaS, or will it be deployed on-premises? (Indicate if this is a thin client, thick client, web extension, plugin, etc.)

Provide the best contact for information related to questions related to the AI included in the product (if different than the representative listed in Section I.)

NAME	E-MAIL	PHONE NUMBER

III. SIGNATURE

By signing this document, I have identified and reported any AI use in the performance of this product in question.

Signature	Date

ARTIFICIAL INTELLIGENCE (AI) DISCLOSURE FORM (Instructions)

Instructions:

The Department of Parks and Recreation (DPR) is required to track and complete risk assessments for any Generative Artificial Intelligence (GenAI) purchases. This document is intended to help DPR identify GenAI and assess the risk related to any GenAI purchases.

Section I:

Bidders shall fill in their contact information.

The DPR staff shall fill out the Description of Services in detail and/or reference the applicable Statement of Work or attachment(s). Include the services to be provided related to AI and include the names of products and large language model. It is important to include as much detail as possible related to any AI aspect of the potential purchase.

SAMPLE

Section II:

Bidders shall disclose any aspect of AI related to the purchase.

If “no” is selected, no further information is required in this section.

If “yes” is selected, the Bidder shall fill out answers to questions 1-5. Bidders should provide as much detail as possible related to the AI technology, model, service or system as it relates to what the DPR is soliciting for.

If GenAI is selected and the DPR staff intends to pursue the product, the DPR staff must complete the SIMM 5305-F GenAI Intelligence Risk Assessment, Data Classification section and the Risk Assessment Questionnaire questions a-j; and submit it to ISPO@parks.ca.gov with a cc: to both PMO@parks.ca.gov and DPR-IT.Procurement@parks.ca.gov. Contact ISPO@parks.ca.gov for assistance with completing this assessment.

Upon review, ISPO will contact the DPR staff for more information, if needed, prior to submitting the finalized document to the California Department of Technology.

Procurement efforts will be placed on temporary hold pending CDT approval.

Definitions:

- IaaS – Infrastructure as a Service is a cloud computing model that provides on-demand access to virtualized computing resources like servers, storage, and networking.
- PaaS – Platform as a Service is a cloud computing model that provides a complete platform for developing, running, and managing applications.
- SaaS – Software as a Service a cloud-based software delivery model where users access and use applications over the internet via a subscription rather than purchasing and installing software locally.

Section III:

Bidder signatures are required to certify all provided information on this document is true and accurate to the best of their knowledge.

STATE OF CALIFORNIA
CALIFORNIA CIVIL RIGHTS LAWS ATTACHMENT
DGS OLS 04 (Rev. 01/17)

DEPARTMENT OF GENERAL SERVICES
OFFICE OF LEGAL SERVICES

Pursuant to Public Contract Code section 2010, a person that submits a bid or proposal to, or otherwise proposes to enter into or renew a contract with, a state agency with respect to any contract in the amount of $100,000 or above shall certify, under penalty of perjury, at the time the bid or proposal is submitted or the contract is renewed, all of the following:

1. CALIFORNIA CIVIL RIGHTS LAWS: For contracts executed or renewed after January 1, 2017, the contractor certifies compliance with the Unruh Civil Rights Act (Section 51 of the Civil Code) and the Fair Employment and Housing Act (Section 12960 of the Government Code); and

2. EMPLOYMENT DISCRIMINATORY POLICIES: For contracts executed or renewed after January 1, 2017, if a Contractor has an internal policy against a sovereign nation or people recognized by the United States government, the Contractor certifies that such policies are not used in violation of the Unruh Civil Rights Act (Section 51 of the Civil Code) or the Fair Employment and Housing Act (Section 12960 of the Government Code).

SAMPLE

CERTIFICATION

I, the official named below, certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Proposer/Bidder Firm Name (Printed)	Federal ID Number

By (Authorized Signature)

Printed Name and Title of Person Signing

Executed in the County of	Executed in the State of

Date Executed

SCO ID: 3790-C2XXXXXXX

STATE OF CALIFORNIA - DEPARTMENT OF GENERAL SERVICES

STANDARD AGREEMENT

STD 213 (Rev. 04/2020)

AGREEMENT NUMBER	PURCHASING AUTHORITY NUMBER (If Applicable)
C2XXXXXXX	

1. This Agreement is entered into between the Contracting Agency and the Contractor named below:

CONTRACTING AGENCY NAME

Department of Parks and Recreation

CONTRACTOR NAME

2. The term of this Agreement is:

START DATE

Notice to Proceed (NTP)

THROUGH END DATE

3. The maximum amount of this Agreement is:

$

Dollars and Zero Cents

SAMPLE

4. The parties agree to comply with the terms and conditions of the following exhibits, which are by this reference made a part of the Agreement.

Exhibits	Title	Pages
Exhibit A	Scope of Work	1
Exhibit B	Budget Detail and Payment Provisions	2
Exhibit B	Attachment I, Public Works Bid Forms	2
Exhibit B	Attachment II, Bidder Declaration (GSPD 05-105)	1
Exhibit C *	General Terms and Conditions (GTC)	04/2017
Exhibit D	Special Terms and Conditions	1
Exhibit D	Attachment I, Project Manual	XX

Items shown with an asterisk (*), are hereby incorporated by reference and made part of this agreement as if attached hereto.
These documents can be viewed at https://www.dgs.ca.gov/OLS/Resources

IN WITNESS WHEREOF, THIS AGREEMENT HAS BEEN EXECUTED BY THE PARTIES HERETO.

CONTRACTOR

CONTRACTOR NAME (if other than an individual, state whether a corporation, partnership, etc.)

CONTRACTOR BUSINESS ADDRESS	CITY	STATE	ZIP

PRINTED NAME OF PERSON SIGNING	TITLE

CONTRACTOR AUTHORIZED SIGNATURE	DATE SIGNED

SCO ID: 3790-C2XXXXXXX

STATE OF CALIFORNIA - DEPARTMENT OF GENERAL SERVICES
STANDARD AGREEMENT
STD 213 (Rev. 04/2020)

AGREEMENT NUMBER	PURCHASING AUTHORITY NUMBER (If Applicable)
C2XXXXXXX	

STATE OF CALIFORNIA

CONTRACTING AGENCY NAME			
Department of Parks and Recreation			
CONTRACTING AGENCY ADDRESS	**CITY**	**STATE**	**ZIP**
2241 Harvard Street, Suite 200	Sacramento	CA	95815
PRINTED NAME OF PERSON SIGNING	**TITLE**		
Brian Dewey	Assistant Deputy Director,Facilities & Development		
CONTRACTING AGENCY AUTHORIZED SIGNATURE	**DATE SIGNED**		
CALIFORNIA DEPARTMENT OF GENERAL SERVICES APPROVAL	**EXEMPTION (If Applicable)**		
	DGS APPROVAL NOT REQUIRED Exempt per PCC § 10106(a)(3) Exempt per PCC § 10107		

SAMPLE

EXHIBIT A — Public Works
(Standard Agreement)

SCOPE OF WORK

1. Contractor agrees to furnish all labor, tools, materials and equipment necessary to:

SAMPLE

2. The work shall be performed at:

3. The work shall be provided during:

4. The project representatives during the term of this agreement will be:

State Agency:		Contractor:	
Section/Unit:		Section/Unit:	
Attention:		Attention:	
Address:		Address:	
City/State/Zip Code:		City/State/Zip Code:	
Phone:		Phone:	
Fax:		Fax:	
E-mail:		E-mail:	

EXHIBIT B — PUBLIC WORKS
(Standard Agreement)

SAMPLE

BUDGET DETAIL AND PAYMENT PROVISIONS

1. Invoicing and Payment

A. For services satisfactorily rendered, and upon receipt and approval of the invoices, the State agrees to compensate the Contractor for actual expenditures incurred in accordance with the rates specified in the Bid Form, marked Exhibit B, Attachment 1, which is attached hereto and made a part of this Agreement.

B. Invoices shall include the Agreement Number and shall be submitted in triplicate not more frequently than monthly in arrears to:

2. Budget Contingency Clause

A. It is mutually agreed that if the Budget Act of the current year and/or any subsequent years covered under this Agreement does not appropriate sufficient funds for the program, this Agreement shall be of no further force and effect. In this event, the State shall have no liability to pay any funds whatsoever to Contractor or to furnish any other considerations under this Agreement and Contractor shall not be obligated to perform any provisions of this Agreement.

B. If funding for any fiscal year is reduced or deleted by the Budget Act for purposes of this program, the State shall have the option to either cancel this Agreement with no liability occurring to the State, or offer an agreement amendment to Contractor to reflect the reduced amount.

3. Prompt Payment Clause

Payment will be made in accordance with, and within the time specified in, Government Code Chapter 4.5, commencing with Section 927.

4. Compensation

Contractor shall submit to the State an itemized request for payment, in triplicate, no more than once each 30 day period. All invoices or requests for payment, not on Contractor's preprinted stationery, shall be signed by the Contractor or his authorized representative and submitted to the State's Representative as indicated in paragraph 1B above.

Five percent (5%) shall be retained from each progress payment and held by the State as partial security for the fulfillment of the contract by the Contractor. The State shall pay the Contractor the value of such work, as estimated therein, after deducting therefrom all previous payments, and all amounts to be retained under the provisions of this Agreement. No progress payments will be made by the State for project terms less than thirty (30) days. The one and only payment will be the final payment made by the State upon satisfactory completion of all work required under the contract documents.

EXHIBIT B — PUBLIC WORKS
(Standard Agreement)

BUDGET DETAIL AND PAYMENT PROVISIONS

5. Disabled Veterans Participation Goals

A. Upon completion of an award contract in which a commitment to achieve a DVBE goal was made, the prime contractor that entered into a subcontract with a DVBE is required to complete and submit form STD. 817 within 60 days to certify payment information to the awarding department, in accordance with Military and Veterans Code (M&VC) Section 999.5.

SAMPLE

B. For contracts awarded on or after January 1, 2021, pursuant to M&VC Section 999.7, the State shall withhold ten thousand dollars ($10,000) from the final payment, or the full final payment if less than ten thousand dollars ($10,000), until the prime contractor complies with the certification requirements of M&VC Section 999.5. Prime contractors that fail to comply with the certification requirements shall be given notice and allowed to cure the defect. If after 15 calendar days but not more than 30 calendar days from the date of the notice, the prime contractor fails to comply with the certification requirements, the State shall permanently deduct ten thousand ($10,000) from the final payment, or the full payment if less than ten thousand dollar ($10,000). The withholding applies to all contracts with a DVBE subcontractor.

C. Notwithstanding any other law, an awarding department shall not withhold more than the amount specified on the final payment of any disabled veteran business enterprise contract for the purposes of ensuring compliance with the certification requirements of M&VC 999.5.

State of California - Natural Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Exhibit B, Attachment 1

PUBLIC WORKS BID FORM

BID TIME	BID
2:00 P.M.	November 24, 2026
PROJECT LOCATION	
CASWELL MEMORIAL SP	
PROJECT NAME	
C26863031 Campground and Day Use Improvements	

Nondiscrimination Compliance Statement: The prospective contractor's signature affixed hereon and dated shall constitute a certification under penalty of perjury under the laws of the State of California that the bidder has, unless exempted, complied with the nondiscrimination program requirements of Government Code Section 12990 and Title 2, California Code of Regulations, Section 8103.

Verification: By signing this Bid Form, the bidder assures the state that it has not been convicted of violating a state or federal law regarding the employment of undocumented aliens, in the preceding five years.

The prospective contractor's signature affixed hereon and dated shall constitute a certification that the representations made by the prospective contract in the bid are made under penalty of perjury under the laws of the State of California.

Important: *Pursuant to Title 2, California Code of Regulations, Section 8103 and Business and Professions Code Section 7028.15, no bid will be considered unless it contains the certifications and license information requested on this form. The State reserves the right to waive any irregularity in any bid or to reject any or all bids.*

CERTIFICATION

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that I am duly authorized to legally bind the prospective Contractor to the clause(s) listed above. This certification is made under the laws of the State of California. I understand that failure to submit the Public Works Bid Form with the appropriate bidder signature will result in rejection of the bid.

SAMPLE

BY *(Authorized Signature)* DATE

PRINTED NAME AND TITLE OF PERSON SIGNING

CONTRACTOR/BIDDER FIRM NAME *(Printed) - AS IT APPEARS ON LICENSE*	PHONE NO.	FAX NO.
MAILING ADDRESS CITY/STATE/ZIP CODE EMAIL		

LICENSE CLASSIFICATION STATUS OF BUSINESS *(Check appropriate box.)*	LICENSE NO.	LICENSE EXPIRATION DATE.	DIR REGISTRATION NO.

☐ Individual.

☐ Corporation. State in which incorporated: _____

☐ Partnership. Full names of partners: _____

Listed hereinafter are the names, addresses and contractor's license numbers of all subcontractors who will work or labor or render services in an amount in excess of one-half of one percent of the general contractor's total bid if this bid is accepted and the portion of the work that each will perform. Material vendors are not included.

KIND OF WORK	NAME AND ADDRESS	LICENSE NO. & DIR NO.

The bidder hereby proposes to furnish all labor, materials, tools and equipment necessary to upgrade the campground and day use areas at **CASWELL MEMORIAL SP** in San Joaquin County, California, complete and ready for use in accordance with the contract documents therefore, for the following lump sum which shall include all applicable taxes and other expenses:

Base Bid Lump Sum Total: **$_____**

Base Bid Lump Sum Total Written Out:

_____

SAMPLE

ADDENDUM ACKNOWLEDGEMENT (Please initial for Addenda received)

Addendum #1 _____ Addendum #4 _____

Addendum #2 _____ Addendum #5 _____

Addendum #3 _____ Addendum #6 _____

The bidder agrees to complete all work within **THREE HUNDRED SIXTY-FIVE (365)** calendar days from the date of written notice to commence work. This time includes ten (10) calendar days allowed for the contractor to begin work.

EXHIBIT D — PUBLIC WORKS
(Standard Agreement)

SPECIAL TERMS AND CONDITIONS

1. **Project Manual**

The Project Manual, marked Exhibit D, Attachment I, containing general conditions, plans and specifications, and other pertinent bid documents related to this project, as enumerated in the Project Manual's Table of Contents, is hereby attached and incorporated into this agreement.

SAMPLE

2. **Public Works - Rules/Regulations**

Contractor shall observe and comply with all federal, state, city, and county laws, rules or regulations affecting the work. Any work done that does not comply with any laws, rules, or regulations will be remedied at the Contractor's expense.

3. **Executive Order N-6-22 – Russia Sanctions**

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (the EO) regarding Economic Sanctions against Russia and Russian entities and individuals. "Economic Sanctions" refers to sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law. The EO directs state agencies to terminate contracts with, and to refrain from entering any new contracts with, individuals or entities that are determined to be a target of Economic Sanctions. Accordingly, should the State determine Contractor is a target of Economic Sanctions or is conducting prohibited transactions with sanctioned individuals or entities, that shall be grounds for termination of this agreement. The State shall provide Contractor advance written notice of such termination, allowing Contractor at least 30 calendar days to provide a written response. Termination shall be at the sole discretion of the State.

PAYMENT BOND TO ACCOMPANY CONSTRUCTION CONTRACT

(Public Contract Code Sections 7103 and 10221)

BOND NO._____

The premium on this bond is _____ for the term of _____

Know All Men By These Presents:

That the State of California, acting by and through the_____, has awarded to _____whose address for service is _____, as Principal, a contract for the work described as follows:

Project Title: _____

Project Location: _____

WHEREAS, the provisions of Public Contract Code Sections 7103 and 10221 require that the Principal file a bond in connection with said contract and this bond is executed and tendered in accordance therewith.

NOW THEREFORE, Principal and _____, a Surety Corporation organized under the laws of _____, and authorized to transact a general surety business is in the State of California, as Surety, are held and firmly bound to the People of the State of California in the penal sum of_____, for which payment we bind ourselves, our heirs, executors, administrators, successors and assigns jointly and severally, firmly by these presents.

SAMPLE

THE CONDITION OF THIS OBLIGATION IS SUCH,

1. That if said Principal or its subcontractors shall fail to pay any of the persons named in Civil Code Section 9100, or amounts due under the Unemployment Insurance Code with respect to work or labor performed under the contract, or for any amounts required to be deducted, withheld, and paid over to the Employment Development Department from the wages of employees of the Principal and subcontractors pursuant to Section 13020 of the Unemployment Insurance Code, with respect to such work and labor, that the surety herein will pay for the same, otherwise this obligation is to be void. In case suit is brought upon this bond, the Surety will pay a reasonable attorney's fee to be fixed by the court.
2. This bond shall inure to the benefit of any persons named in Civil Code Section 9100 as to give a right of action to such persons or their assigned in any suit brought upon this bond.
3. The aggregate liability of the Surety hereunder, including costs and attorney fees, on all claims whatsoever shall not exceed the penal sum of the bond in accordance with the provisions of Section 996.470(a) of the Code of Civil Procedure.
4. This bond is executed by the Surety, to comply with the provisions of Public Contract Code Sections 7103, 10221 and 10222, of Chapter 5, Title 3, Part 6, Division 4 of the Civil Code and of Chapter 2, Title 14, Part 2 of the Code of Civil Procedure and said bond shall be subject to all of the terms and provisions thereof.
5. This bond may be cancelled by the Surety in accordance with the provisions of Section 996.310 et seq. of the Code of Civil Procedure.
6. This bond to become effective _____

_____ (NAME OF SURETY)

_____ (ADDRESS FOR SERVICE)

I certify (or declare) under penalty of perjury under the laws of the State of California that I have executed the foregoing bond under an unrevoked power of attorney.

Executed in _____ (CITY AND STATE) on _____ (DATE)

_X_____
(SIGNATURE OF ATTORNEY IN FACT)

_____
(PRINTED OR TYPED NAME OR ATTORNEY IN FACT)

PERFORMANCE BOND TO ACCOMPANY CONTRACT

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, The State of California, acting by and through the Department of Parks and Recreation, has awarded to **CONTRACTOR** a corporation existing under and by virtue of the laws of the State of California as principal, hereinafter designated as the "Contractor", a contract for the work described as follows:

PARK NAME, Project Name

AND WHEREAS, Said Contractor is required to furnish a bond in connection with said contract, guaranteeing the faithful performance thereof;

NOW, THEREFORE, We the undersigned Contractor and surety are held and firmly bound unto the State of California, in the sum of **Contract Amount ($00.00)** to be paid to the State or its certain attorney, its successors and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally, firmly by these presents.

SAMPLE

THE CONDITION OF THIS OBLIGATION IS SUCH,

That if the above bound Contractor, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the foregoing contract and any alteration thereof made as therein provided, on his or their part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the State of California, its officers and agents, as therein stipulated, then this obligation shall become and be null and void; otherwise, it shall be and remain in full force and virtue.

IN WITNESS WHEREOF, We have hereunto set our hands and seals on this _____ day of _____, 20___.

_____

By _____
Contractor

_____ (Seal)
Name of Surety

By_____
Attorney-in-Fact

NOTE: Signatures of those executing for the surety must be properly acknowledged, and a Power of Attorney attached.

CERTIFICATE OF ACKNOWLEDGEMENT

State of California
County of _____ ss

On this _____ day of _____ in the year 20_____ before me, a notary public in and for

The county and state aforesaid, personally appeared _____
(Attorney-in-Fact)
Known to me to be the person whose name is subscribed to the within instrument and known to me to be the Attorney-in-Fact of

_____ and acknowledged to me that he subscribed the name of the said company thereto as surety, and his own name as Attorney-in-Fact.

(SEAL)

_____
NOTARY PUBLIC

Print Form | Reset Form

STATE OF CALIFORNIA – DEPARTMENT OF FINANCE

PAYEE DATA RECORD

(Required when receiving payment from the State of California in lieu of IRS W-9 or W-7)

STD 204 (Rev. 03/2021)

Section 1 – Payee Information

NAME (This is required. Do not leave this line blank. Must match the payee's federal tax return)

BUSINESS NAME, DBA NAME or DISREGARDED SINGLE MEMBER LLC NAME (If different from above)

MAILING ADDRESS (number, street, apt. or suite no.) (See instructions on Page 2)

CITY, STATE, ZIP CODE	E-MAIL ADDRESS

Section 2 – Entity Type

Check one (1) box only that matches the entity type of the Payee listed in Section 1 above. (See instructions on page 2)

- ☐ **SOLE PROPRIETOR / INDIVIDUAL**
- ☐ **SINGLE MEMBER LLC** *Disregarded Entity owned by an individual*
- ☐ **PARTNERSHIP**
- ☐ **ESTATE OR TRUST**

CORPORATION (see instructions on page 2)

- ☐ **MEDICAL** *(e.g., dentistry, chiropractic, etc.)*
- ☐ **LEGAL** *(e.g., attorney services)*
- ☐ **EXEMPT** *(e.g., nonprofit)*
- ☐ **ALL OTHERS**

SAMPLE

Section 3 – Tax Identification Number

Enter your Tax Identification Number (TIN) in the appropriate box. The TIN must **match** the name given in Section 1 of this form. Do not provide more than one (1) TIN. The TIN is a 9-digit number. **Note:** Payment will not be processed without a TIN.

- For **Individuals**, enter SSN.
- If you are a **Resident Alien**, and you do not have and are not eligible to get an SSN, enter your ITIN.
- Grantor Trusts (such as a Revocable Living Trust while the grantors are alive) may not have a separate FEIN. Those trusts must enter the individual grantor's SSN.
- For **Sole Proprietor or Single Member LLC (disregarded entity), in which the sole member is an individual**, enter SSN (ITIN if applicable) or FEIN (FTB prefers SSN).
- For **Single Member LLC (disregarded entity), in which the sole member is a business entity**, enter the owner entity's FEIN. Do not use the disregarded entity's FEIN.
- For all other entities including LLC that is taxed as a corporation or partnership, estates/trusts (with FEINs), enter the entity's FEIN.

Social Security Number (SSN) or Individual Tax Identification Number (ITIN)

___ ___ ___ -___ ___ - ___ ___ ___ ___

OR

Federal Employer Identification Number (FEIN)

___ ___ - ___ ___ ___ ___ ___ ___ ___

Section 4 – Payee Residency Status (See instructions)

☐ **CALIFORNIA RESIDENT** – Qualified to do business in California or maintains a permanent place of business in California.

☐ **CALIFORNIA NONRESIDENT** – Payments to nonresidents for services may be subject to state income tax withholding.

☐ No services performed in California

☐ Copy of Franchise Tax Board waiver of state withholding is attached.

Section 5 – Certification

I hereby certify under penalty of perjury that the information provided on this document is true and correct. Should my residency status change, I will promptly notify the state agency below.

NAME OF AUTHORIZED PAYEE REPRESENTATIVE	TITLE	E-MAIL ADDRESS

SIGNATURE	DATE	TELEPHONE *(include area code)*

Section 6 – Paying State Agency

Please return completed form to:

STATE AGENCY/DEPARTMENT OFFICE	UNIT/SECTION
Department of Parks and Recreation	Park Operations Adminstrative Services Division
MAILING ADDRESS	**FAX**
2241 Harvard Street, Suite 200	

CITY	STATE	ZIP CODE	E-MAIL ADDRESS
Sacramento	CA	95815	merrilee.byrnes@parks.ca.gov

STATE OF CALIFORNIA – DEPARTMENT OF FINANCE

PAYEE DATA RECORD

(Required when receiving payment from the State of California in lieu of IRS W-9 or W-7)

STD 204 (Rev. 03/2021)

GENERAL INSTRUCTIONS

Type or print the information on the Payee Data Record, STD 204 form. Sign, date, and return to the state agency/department office address shown in Section 6. Prompt return of this fully completed form will prevent delays when processing payments.

Information provided in this form will be used by California state agencies/departments to prepare Information Returns (Form1099).
NOTE: Completion of this form is optional for Government entities, i.e. federal, state, local, and special districts.

A completed Payee Data Record, STD 204 form, is required for all payees (non-governmental entities or individuals) entering into a transaction that may lead to a payment from the state. Each state agency requires a completed, signed, and dated STD 204 on file; therefore, it is possible for you to receive this form from multiple state agencies with which you do business.

Payees who do not wish to complete the STD 204 may elect not to do business with the state. If the payee does not complete the STD 204 and the required payee data is not otherwise provided, payment may be reduced for federal and state backup withholding. Amounts reported on Information Returns (Form 1099) are in accordance with the Internal Revenue Code (IRC) and the California Revenue and Taxation Code (R&TC).

Section 1 – Payee Information

Name – Enter the name that appears on the payee's federal tax return. The name provided shall be the tax liable party and is subject to IRS TIN matching (when applicable).

- Sole Proprietor/Individual/Revocable Trusts – enter the name shown on your federal tax return.
- Single Member Limited Liability Companies (LLCs) that is disregarded as an entity separate from its owner for federal tax purposes - enter the name of the individual or business entity that is tax liable for the business in section 1. Enter the DBA, LLC name, trade, or fictitious name under Business Name.
- Note: for the State of California tax purposes, a Single Member LLC is not disregarded from its owner, even if they may be disregarded at the Federal level.
- Partnerships, Estates/Trusts, or Corporations – enter the entity name as shown on the entity's federal tax return. The name provided in Section 1 must match to the TIN provided in section 3. Enter any DBA, trade, or fictitious business names under Business Name.

Business Name – Enter the business name, DBA name, trade or fictitious name, or disregarded LLC name.
Mailing Address – The mailing address is the address where the payee will receive information returns. Use form STD 205, Payee Data Record Supplement to provide a remittance address if different from the mailing address for information returns, or make subsequent changes to the remittance address.

SAMPLE

Section 2 – Entity Type

If the Payee in Section 1 is a(n)…	THEN Select the Box for…
Individual ● Sole Proprietorship ● Grantor (Revocable Living) Trust disregarded for federal tax purposes	Sole Proprietor/Individual
Limited Liability Company (LLC) owned by an individual and is disregarded for federal tax purposes	Single Member LLC-owned by an individual
Partnerships ● Limited Liability Partnerships (LLP) ● and, LLC treated as a Partnership	Partnerships
Estate ● Trust (other than disregarded Grantor Trust)	Estate or Trust
Corporation that is medical in nature (e.g., medical and healthcare services, physician care, nursery care, dentistry, etc. ● LLC that is to be taxed like a Corporation and is medical in nature	Corporation-Medical
Corporation that is legal in nature (e.g., services of attorneys, arbitrators, notary publics involving legal or law related matters, etc.) ● LLC that is to be taxed like a Corporation and is legal in nature	Corporation-Legal
Corporation that qualifies for an Exempt status, including 501(c) 3 and domestic non-profit corporations.	Corporation-Exempt
Corporation that does not meet the qualifications of any of the other corporation types listed above ● LLC that is to be taxed as a Corporation and does not meet any of the other corporation types listed above	Corporation-All Other

Section 3 – Tax Identification Number

The State of California requires that all parties entering into business transactions that may lead to payment(s) from the state provide their Taxpayer Identification Number (TIN). The TIN is required by R&TC sections 18646 and 18661 to facilitate tax compliance enforcement activities and preparation of Form 1099 and other information returns as required by the IRC section 6109(a) and R&TC section 18662 and its regulations.

Section 4 – Payee Residency Status

Are you a California resident or nonresident?

- A corporation will be defined as a "resident" if it has a permanent place of business in California or is qualified through the Secretary of State to do business in California.
- A partnership is considered a resident partnership if it has a permanent place of business in California.
- An estate is a resident if the decedent was a California resident at time of death.
- A trust is a resident if at least one trustee is a California resident.
  - For individuals and sole proprietors, the term "resident" includes every individual who is in California for other than a temporary or transitory purpose and any individual domiciled in California who is absent for a temporary or transitory purpose. Generally, an individual who comes to California for a purpose that will extend over a long or indefinite period will be considered a resident. However, an individual who comes to perform a particular contract of short duration will be considered a nonresident.

For information on Nonresident Withholding, contact the Franchise Tax Board at the numbers listed below:

Withholding Services and Compliance Section: 1-888-792-4900 E-mail address: wscs.gen@ftb.ca.gov
For hearing impaired with TDD, call: 1-800-822-6268 Website: www.ftb.ca.gov

Section 5 – Certification

Provide the name, title, email address, signature, and telephone number of individual completing this form and date completed. In the event that a SSN or ITIN is provided, the individual identified as the tax liable party must certify the form. Note: the signee may differ from the tax liable party in this situation if the signee can provide a power of attorney documented for the individual.

Section 6 – Paying State Agency

This section must be completed by the state agency/department requesting the STD 204.

Privacy Statement

Section 7(b) of the Privacy Act of 1974 (Public Law 93-579) requires that any federal, state, or local governmental agency, which requests an individual to disclose their social security account number, shall inform that individual whether that disclosure is mandatory or voluntary, by which statutory or other authority such number is solicited, and what uses will be made of it. It is mandatory to furnish the information requested. Federal law requires that payment for which the requested information is not provided is subject to federal backup withholding and state law imposes noncompliance penalties of up to $20,000. You have the right to access records containing your personal information, such as your SSN. To exercise that right, please contact the business services unit or the accounts payable unit of the state agency(ies) with which you transact that business.

All questions should be referred to the requesting state agency listed on the bottom front of this form.

Print Form Reset Form

STATE OF CALIFORNIA – STATE CONTROLLERS OFFICE

PAYEE DATA RECORD SUPPLEMENT

(This form is optional. Form is used to provide remittance address information if different than the mailing address on the STD 204 – Payee Data Record. Use this form to provide additional remittance addresses and additional Authorized Representatives of the Payee not identified on the STD 204.)

STD 205 (New 03/2021)

Payee Information (must match the STD 204)

NAME (*Required. Do not leave blank.*)

TAX ID NUMBER (*Required*)
SSN, ITIN, or FEIN that matches Tax ID number provided on STD 204

BUSINESS NAME, DBA NAME or DISREGARDED SINGLE MEMBER LLC NAME
(*If different from above*)

Additional Remittance Address Information

- Use the fields below to provide remittance addresses for payee if different from the mailing address on the STD 204.
- ***The addresses provided below are for remittance purposes only. 1099 information returns will be sent to the mailing address specified on the STD 204.***

SAMPLE

1	**REMITTANCE ADDRESS** (number, street, apt or suite no.)		
	CITY	**STATE**	**ZIP CODE**
2	**REMITTANCE ADDRESS**		
	CITY	**STATE**	**ZIP CODE**
3	**REMITTANCE ADDRESS**		
	CITY	**STATE**	**ZIP CODE**
4	**REMITTANCE ADDRESS**		
	CITY	**STATE**	**ZIP CODE**
5	**REMITTANCE ADDRESS**		
	CITY	**STATE**	**ZIP CODE**

Additional Contact Information

Use the fields below to provide additional Authorized Representatives for the Payee if applicable.

1	**CONTACT NAME**	
	TELEPHONE *(Include area code)*	**EMAIL**
2	**CONTACT NAME**	
	TELEPHONE	**EMAIL**
3	**CONTACT NAME**	
	TELEPHONE	**EMAIL**

Certification

I hereby certify under penalty of perjury that the information provided on this supplemental document is true and correct.

By signing this document, I authorize the State of California to remit payment to the addresses specified on this supplemental form (STD 205) and certify that all persons identified on this form are authorized representatives of this payee. Payments remitted to any of the listed addresses may be reported on 1099 information returns to the tax liable entity identified on the accompanying Payee Data Record - STD 204.

NAME OF AUTHORIZED PAYEE REPRESENTATIVE (Print or Type name)	**TITLE**	**E-MAIL ADDRESS**
SIGNATURE X_____	**DATE**	**TELEPHONE** *(Include area code)*

STATE OF CALIFORNIA – STATE CONTROLLERS OFFICE

PAYEE DATA RECORD SUPPLEMENT

(This form is optional. Form is used to provide remittance address information if different than the mailing address on the STD 204 – Payee Data Record. Use this form to provide additional remittance addresses and additional Authorized Representatives of the Payee not identified on the STD 204.)

STD 205 (New 03/2021)

GENERAL INSTRUCTIONS

Type or print the information on the Payee Data Record Supplement, STD 205. Sign, date, and return to the state agency/department with a completed STD 204. Prompt return of the fully completed forms will prevent delays when processing payments.

Purpose – Completion of this form (STD 205) is optional. Payees may use this form to provide remittance addresses or contact information in addition to the 1099 information return mailing address provided on the STD 204. This form shall only be used in conjunction with the STD 204, and will not be accepted without a STD 204.

Please note: The State of California Government will issue 1099 information returns to the mailing address provided on the most recently dated form STD 204 validated by the Payee. Addresses provided on this form (STD 205) will be used for remittance purposes only. If the payee would like to update the address for receiving 1099 information returns, please complete the STD 204.

Payee Information: The Payee's Tax ID number (TIN) and Name (including any Business, DBA, or Disregarded LLC names) are required. This information is subject to TIN matching via the IRS database for validation. Payee Information provided in this section must clearly match the STD 204. Any discrepancies may result in delays of payment, up to and including denial of the request.

SAMPLE

Name – Enter the name of the Payee. The name provided shall be the tax liable party and is subject to IRS TIN matching (when applicable).

Business Name – Enter the business name, DBA name, trade or fictitious name, or disregarded LLC name.

Tax ID Number-The State of California requires that all parties entering into business transactions that may lead to payment(s) from the state provide their Taxpayer Identification Number (TIN). The TIN is required by R&TC sections 18646 and 18661 to facilitate tax compliance enforcement activities and preparation of Form 1099 and other information returns as required by the IRC section 6109(a) and R&TC section 18662 and its regulations.

Additional Remittance Address Information - Enter the Payee's additional remittance address(s) that are not listed on STD 204. Up to five (5) addresses may be provided on this form. The Payee may provide additional remittance addresses on a second STD 205 form if needed.

Additional Contact Information - Enter the Payee's additional or updated contact information. Up to three contacts may be identified on this form. Payee may provide additional contacts on a second STD 205 if needed.

PRIVACY STATEMENT

Section 7(b) of the Privacy Act of 1974 (Public Law 93-579) requires that any federal, state, or local governmental agency, which requests an individual to disclose their social security account number, shall inform that individual whether that disclosure is mandatory or voluntary, by which statutory or other authority such number is solicited, and what uses will be made of it.

It is mandatory to furnish the information requested. Federal law requires that payment for which the requested information is not provided is subject to federal backup withholding and state law imposes noncompliance penalties of up to $20,000.

You have the right to access records containing your personal information, such as your SSN. To exercise that right, please contact the business services unit or the accounts payable unit of the state agency(ies) with which you transact that business.

All questions should be referred to the requesting state agency listed on the bottom front of the STD 204 form.

Contractor Certification Clauses

CCC 04/2017

CERTIFICATION

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that I am duly authorized to legally bind the prospective Contractor to the clause(s) listed below. This certification is made under the laws of the State of California.

Contractor/Bidder Firm Name (Printed)	Federal ID Number
By (Authorized Signature)	
Printed Name and Title of Person Signing	
Date Executed	Executed in the County of

SAMPLE

CONTRACTOR CERTIFICATION CLAUSES

1. STATEMENT OF COMPLIANCE: Contractor has, unless exempted, complied with the nondiscrimination program requirements. (Gov. Code §12990 (a-f) and CCR, Title 2, Section 11102) (Not applicable to public entities.)

2. DRUG-FREE WORKPLACE REQUIREMENTS: Contractor will comply with the requirements of the Drug-Free Workplace Act of 1990 and will provide a drug-free workplace by taking the following actions:

a. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations.

b. Establish a Drug-Free Awareness Program to inform employees about:

1) the dangers of drug abuse in the workplace;

2) the person's or organization's policy of maintaining a drug-free workplace;

3) any available counseling, rehabilitation and employee assistance programs; and,

4) penalties that may be imposed upon employees for drug abuse violations.

c. Every employee who works on the proposed Agreement will:

1) receive a copy of the company's drug-free workplace policy statement; and,

2) agree to abide by the terms of the company's statement as a condition of employment on the Agreement.

Failure to comply with these requirements may result in suspension of payments under the Agreement or termination of the Agreement or both and Contractor may be ineligible for award of any future State agreements if the department determines that any of the following has occurred: the Contractor has made false certification, or violated the certification by failing to carry out the requirements as noted above. (Gov. Code §8350 et seq.)

3. NATIONAL LABOR RELATIONS BOARD CERTIFICATION: Contractor certifies that no more than one (1) final unappealable finding of contempt of court by a Federal court has been issued against Contractor within the immediately preceding two-year period because of Contractor's failure to comply with an order of a Federal court, which orders Contractor to comply with an order of the National Labor Relations Board. (Pub. Contract Code §10296) (Not applicable to public entities.)

SAMPLE

4. CONTRACTS FOR LEGAL SERVICES $50,000 OR MORE- PRO BONO REQUIREMENT: Contractor hereby certifies that Contractor will comply with the requirements of Section 6072 of the Business and Professions Code, effective January 1, 2003.

Contractor agrees to make a good faith effort to provide a minimum number of hours of pro bono legal services during each year of the contract equal to the lessor of 30 multiplied by the number of full time attorneys in the firm's offices in the State, with the number of hours prorated on an actual day basis for any contract period of less than a full year or 10% of its contract with the State.

Failure to make a good faith effort may be cause for non-renewal of a state contract for legal services, and may be taken into account when determining the award of future contracts with the State for legal services.

5. EXPATRIATE CORPORATIONS: Contractor hereby declares that it is not an expatriate corporation or subsidiary of an expatriate corporation within the meaning of Public Contract Code Section 10286 and 10286.1, and is eligible to contract with the State of California.

6. SWEATFREE CODE OF CONDUCT:

a. All Contractors contracting for the procurement or laundering of apparel, garments or corresponding accessories, or the procurement of equipment, materials, or supplies, other than procurement related to a public works contract, declare under penalty of perjury that no apparel, garments or corresponding accessories, equipment, materials, or supplies furnished to the state pursuant to the contract have been laundered or produced in whole or in part by sweatshop labor, forced labor, convict labor, indentured labor under penal sanction, abusive forms of child labor or exploitation of children in sweatshop labor, or with the benefit of sweatshop labor, forced labor, convict labor, indentured labor under penal sanction, abusive forms of child labor or exploitation of children in sweatshop labor. The contractor further declares under penalty of perjury that they adhere to the Sweatfree Code of Conduct as set forth on the California Department of Industrial Relations website located at www.dir.ca.gov, and Public Contract Code Section 6108.

b. The contractor agrees to cooperate fully in providing reasonable access to the contractor's records, documents, agents or employees, or premises if reasonably

required by authorized officials of the contracting agency, the Department of Industrial Relations, or the Department of Justice to determine the contractor's compliance with the requirements under paragraph (a).

7. DOMESTIC PARTNERS: For contracts of $100,000 or more, Contractor certifies that Contractor is in compliance with Public Contract Code section 10295.3.

8. GENDER IDENTITY: For contracts of $100,000 or more, Contractor certifies that Contractor is in compliance with Public Contract Code section 10295.35.

DOING BUSINESS WITH THE STATE OF CALIFORNIA

SAMPLE

The following laws apply to persons or entities doing business with the State of California.

1. CONFLICT OF INTEREST: Contractor needs to be aware of the following provisions regarding current or former state employees. If Contractor has any questions on the status of any person rendering services or involved with the Agreement, the awarding agency must be contacted immediately for clarification.

Current State Employees (Pub. Contract Code §10410):

1). No officer or employee shall engage in any employment, activity or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any state agency, unless the employment, activity or enterprise is required as a condition of regular state employment.

2). No officer or employee shall contract on his or her own behalf as an independent contractor with any state agency to provide goods or services.

Former State Employees (Pub. Contract Code §10411):

1). For the two-year period from the date he or she left state employment, no former state officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements or any part of the decision-making process relevant to the contract while employed in any capacity by any state agency.

2). For the twelve-month period from the date he or she left state employment, no former state officer or employee may enter into a contract with any state agency if he or she was employed by that state agency in a policy-making position in the same general subject area as the proposed contract within the 12-month period prior to his or her leaving state service.

If Contractor violates any provisions of above paragraphs, such action by Contractor shall render this Agreement void. (Pub. Contract Code §10420)

Members of boards and commissions are exempt from this section if they do not receive payment other than payment of each meeting of the board or commission, payment for preparatory time and payment for per diem. (Pub. Contract Code §10430 (e))

2. LABOR CODE/WORKERS' COMPENSATION: Contractor needs to be aware of the provisions which require every employer to be insured against liability for Worker's Compensation or to undertake self-insurance in accordance with the provisions, and

Contractor affirms to comply with such provisions before commencing the performance of the work of this Agreement. (Labor Code Section 3700)

3. AMERICANS WITH DISABILITIES ACT: Contractor assures the State that it complies with the Americans with Disabilities Act (ADA) of 1990, which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA. (42 U.S.C. 12101 et seq.)

4. CONTRACTOR NAME CHANGE: An amendment is required to change the Contractor's name as listed on this Agreement. Upon receipt of legal documentation of the name change the State will process the amendment. Payment of invoices presented with a new name cannot be paid prior to approval of said amendment.

5. CORPORATE QUALIFICATIONS TO DO BUSINESS IN CALIFORNIA:

SAMPLE

a. When agreements are to be performed in the state by corporations, the contracting agencies will be verifying that the contractor is currently qualified to do business in California in order to ensure that all obligations due to the state are fulfilled.

b. "Doing business" is defined in R&TC Section 23101 as actively engaging in any transaction for the purpose of financial or pecuniary gain or profit. Although there are some statutory exceptions to taxation, rarely will a corporate contractor performing within the state not be subject to the franchise tax.

c. Both domestic and foreign corporations (those incorporated outside of California) must be in good standing in order to be qualified to do business in California. Agencies will determine whether a corporation is in good standing by calling the Office of the Secretary of State.

6. RESOLUTION: A county, city, district, or other local public body must provide the State with a copy of a resolution, order, motion, or ordinance of the local governing body which by law has authority to enter into an agreement, authorizing execution of the agreement.

7. AIR OR WATER POLLUTION VIOLATION: Under the State laws, the Contractor shall not be: (1) in violation of any order or resolution not subject to review promulgated by the State Air Resources Board or an air pollution control district; (2) subject to cease and desist order not subject to review issued pursuant to Section 13301 of the Water Code for violation of waste discharge requirements or discharge prohibitions; or (3) finally determined to be in violation of provisions of federal law relating to air or water pollution.

8. PAYEE DATA RECORD FORM STD. 204: This form must be completed by all contractors that are not another state agency or other governmental entity.

SECTION 000700
GENERAL CONDITIONS

1.01 DEFINITIONS

A. Acceptance (or Final Completion) – Acceptance occurs when all the provisions and requirements of the Contract are complete and is so certified by State's Representative.

B. Bulletin – A Bulletin is a written order directed to Contractor and issued by State's Representative, directing a minor change or making a clarification in the Work, or requesting information from Contractor about the Work. A Bulletin is to be used for minor changes or clarifications which State's Representative believes will have no impact on the Contract Sum or Contract Time.

C. Calendar Day (or Day) – A Calendar Day is a day of twenty-four (24) hours measured from one midnight to the next midnight, Pacific Time. Unless otherwise indicated, a "day" shall mean a Calendar Day.

D. Change Order (or Amendment) – A Change Order is a written modification of the Contract Documents made in accordance with the provisions of Section 1.08 of these General Conditions and which has been signed by State and Contractor.

E. Contract (or Contract Documents) – The Contract shall consist of the Notice to Contractors; Instructions to Bidders; Bid Form; Bidders Bond; Standard Agreement – STD. 213; General Conditions; STD. 807, Payment Bond; Performance Bond; Special Provisions; Specifications; Plans; STD. 811, Small Business Preference and Certification; Certificate of Insurance; Addenda; Amendments; Non Collusion Affidavit; Disabled Veteran Business Enterprise Compliance Certification and Documentation; and any other provisions made a part thereto by reference.

F. Contract Time – The Contract Time shall be the number of Calendar Days specified in which the Work is to be completed including any adjustments and/or time extensions that may be granted by State in accordance with the terms of the Contract.

G. Contract Sum – The Contract Sum is the total amount of money stated in the Contract as payable to Contractor for the performance of the Work under the Contract, including authorized adjustments thereto.

H. Contractor – The Contractor is the person, firm, individual, partnership, company, corporation, association, joint venture, or any combination thereof, who has entered into the Contract with State.

I. Event of Default – An Event of Default is an action that permits termination of the Contract as described herein.

J. Field Order – A Field Order is a written order directed to Contractor and signed by State's Representative directing a change or making a clarification in the Work, or requesting information from Contractor about the Work. A Field Order signed by Contractor indicates receipt of the Field Order. A Field Order shall be followed by a Change Order.

K. Legal Holidays – Legal Holidays are every Sunday; January 1; 3rd Monday in January; February 12; 3rd Monday in February; March 31; the last Monday in May; July 4; 1st Monday in September; 2nd Monday in October; November 11; Thanksgiving Day and the following Friday; December 25; and every day so declared by the President of the United States or the Governor of California. If January 1, February 12, March 31, July 4, November 11, or December 25 falls on a Sunday, the following Monday is a holiday. If November 11 falls on a Saturday, the preceding Friday is a holiday.

L. Milestone Date – A Milestone Date is a significant point in the development of the Work that is illustrated on Contractor's Project Work Schedule.

M. Not-in-Contract (NIC) – Not -in-Contract means work not included in the Contract.

N. Project – The Project means the erection, construction, alteration, repair, or improvement to be accomplished under the Contract.

O. Project Work Schedule – The Project Work Schedule is the schedule furnished by Contractor to State in accordance with Section 1.06A(2) of these General Conditions displaying the anticipated schedule for completing the Work.

P. Punch List – The Punch List is the list prepared as a result of a final inspection conducted by State at the completion of the Work indicating items to be completed, corrected, and/or replaced with regard to the Work as specified in the Contract Documents.

Q. **Regular Work Hours –** Eight hours labor constitutes a legal day's work and this Work period shall occur between the hours of 8:00 a.m. and 5:00 p.m. on Working Days unless otherwise agreed by State's Representative.

R. **Schedule of Values –** The Schedule of Values is the statement furnished by Contractor to State in accordance with Section 1.09A of these General Conditions displaying the portions of the Contract Sum allotted for the various parts of the Work and the projected schedule of payment.

S. **State –** The State means the State of California, Department of Parks and Recreation (DPR) and the Director of DPR.

T. **State's Representative –** The State's Representative is the person designated by State to oversee and manage the Contract and completion of the Work on behalf of State and who is the authorized representative of State for this Project. The term State's Representative may be used interchangeably with Project Manager. CONTRACTOR SHALL ONLY TAKE DIRECTION FROM STATE'S REPRESENTATIVE FOR THE CONTRACT AND MAY NOT RELY ON THE COMMUNICATIONS, REPRESENTATIONS OR OTHER INSTRUCTIONS OF OTHER EMPLOYEES, OFFICERS, MANAGERS, CONTRACTORS, OR AGENTS OR REPRESENTATIVES OF STATE UNLESS CONFIRMED BY STATE'S REPRESENTATIVE IN WRITING OR AS OTHERWISE, FROM TIME TO TIME, MAY BE PERMITTED BY THE PROVISIONS OF THE CONTRACT.

U. **Subcontractor –** A Subcontractor is anyone having a direct contract with Contractor or another Subcontractor and includes one who furnishes material worked to a special design according to the Plans and/or Specifications, but does not include one who merely furnishes material not so worked.

V. **Substantial Completion –** Substantial Completion is the point at which, in the discretion of State, in accordance with Section 1.09D of these General Conditions, the Project may be used for the purpose for which it is being constructed exclusive of Punch List items which do not interfere with such use and may be completed notwithstanding use of the Project.

W. **Supplier –** A Supplier is anyone who contracts with Contractor or a Subcontractor to furnish materials or equipment for the Project.

X. **Work –** The Work is everything required to complete the Project, including, but not limited to, all labor, suppliers, material, equipment, and tools.

Y. **Working Day –** A Working Day is every day except Saturdays, Sundays, and Legal Holidays and those days not charged as Working Days pursuant to the Contract Documents.

1.02 CORRELATION AND INTENT OF CONTRACT DOCUMENTS

A. The General Conditions are incorporated into the Contract Documents in their entirety and may not be revised or modified in any way, except by the Supplemental Conditions.

B. What is required by one document shall be as binding as if required by all. In the event of conflicts among the Contract Documents, such conflicts shall be resolved by giving the documents the following order of priority: (1) The Contract between State and Contractor, as the same may be amended (Amendments and revisions of later date take precedence over those of earlier date); (2) Special Conditions; (3) General Conditions; and (4) Drawings and Specifications. Drawings govern Specifications for quantity and location, and Specifications govern Drawings for quality and performance. In the event of ambiguity in quantity or quality, the greater quantity and the higher quality shall govern. Dimensions shall be figured rather than determined by scale or rule. Full-size or large-scale details or Drawings shall govern small-scale details or Drawings.

C. Where conflict exists between the Contract Documents or between the Contract Documents and applicable standards under codes or ordinances promulgated by governmental bodies having jurisdiction over the Project, **CONTRACTOR SHALL BE DEEMED TO HAVE AGREED TO PERFORM THE MOST STRINGENT OR HIGHEST QUALITY WAY OF PERFORMING THE WORK.**

D. Should Contractor discover conflicts, omissions, or errors in the Contract Documents or have any question concerning interpretation or clarification of the Contract Documents, or if it appears to Contractor that the Work to be done or any matters relative thereto are not sufficiently detailed or explained in the Contract Documents, then, before proceeding with the Work affected, Contractor shall immediately notify State's Representative in writing, using an approved Request For Information (RFI) form, and request interpretation, clarification, or furnishing of additional detailed instructions concerning the Work. Such questions shall be resolved and instructions to Contractor issued within fourteen (14) Calendar Days by State, whose decision shall be final and conclusive. Should Contractor proceed with the Work affected before resolution, Contractor shall be responsible for any resultant damage or added cost, and Contractor shall remove, replace, or adjust the Work not in accordance with State's Representative subsequent instructions.

E. All costs and time incurred by Contractor to prepare, review, respond to, estimate, or otherwise process RFI's, Bulletins, Field Orders, Amendments, Schedules, Correspondence, or any other paperwork shall be part of Contractor's base contract overhead and no additional compensation will be allowed therefore.

1.03 CONTRACT BONDS

A. When the Contract Sum exceeds five thousand dollars ($5,000), Contractor shall furnish, in duplicate, a Payment Bond, to accompany the Contract, in an amount equal to one hundred percent (100%) of the Contract Sum securing payment for laborers, mechanics, and material suppliers used on the Work under the Contract. Payment Bonds shall be prepared on a Payment Bond to Accompany Construction Contract (STD. 807) as furnished by State.

B. When the Contract Sum exceeds five thousand dollars ($5,000), Contractor shall furnish, in duplicate, a Performance Bond, to accompany the Contract, in the amount equal to at least one hundred percent (100%) of the Contract Sum guaranteeing faithful performance of the Work. Performance Bonds may be prepared on standard bonding company forms.

C. Payment and Performance Bonds shall be issued by a corporate surety authorized to transact a general surety business in the State of California. Contractor shall deliver its required bonds before the date of execution of the Contract.

D. The bonds must remain in full force and effect for the entire length of time Contractor is involved with the Contract and shall include any warranty periods.

1.04 INSURANCE

A. Insurance Requirements

(1) General Liability Insurance: Contractor shall procure commercial general liability insurance covering liability arising out of premises operations, products/completed operations, independent contractors, personal/advertising injury and liability assumed under an insured contract with limits not less than $1,000,000 each occurrence, $2,000,000 general aggregate and $2,000,000 products/completed operations aggregate. Said policy shall apply separately to each insured against whom any claim is made or suit is brought subject to Contractor's limits of liability.

(2) Builder's Risk/Installation Floater: During the term of this Contract, Contractor shall maintain in force, at its own expense, Builder's Risk/Installation Floater for an amount equal to the full amount of the Contract improvements, upon the project and all materials, or items which is or will become the property of State pursuant to the Contract Documents, including, but not limited to, materials and other items at the work site or stored off-site with the consent of State. A copy of any applicable Builder's Risk/Installation Floater will be provided to State, and it shall be the responsibility of Contractor and each Subcontractor to satisfy itself as to the terms of such coverage, and to determine whether or not at its own cost, to carry any supplemental policy of insurance.

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(3) Motor Vehicle Liability Insurance: Contractor shall maintain motor vehicle liability insurance with limits not less than $1,000,000 combined single limit each accident. Such insurance shall cover liability arising out of an accident involving a motor vehicle in use by Contractor, including, but not limited to, Contractor owned, hired, and non-owned motor vehicles.

(4) Workers' Compensation and Employer's Liability Insurance: Contractor shall maintain statutory worker's compensation and employer's liability insurance for all of Contractor's employees who will be engaged in the performance of work on the property, including special coverage extensions where applicable.

B. Insurance Policies – Each policy of insurance shall: (1) Be in a form acceptable by State; (2) be written by an insurer acceptable to State; (3) be maintained at Contractor's sole expense; (4) require a minimum of ten(10) days written notice to State prior to any cancellation, non-renewal, or modification of insurance coverage; (5) contain an endorsement naming the State of California, its officers, agents, employees, and servants as additionally insured, but only with respect to Work performed for the State of California under this Contract or permit, at no cost to State; the endorsements are to be provided for the general liability and motor vehicle liability policies; (6) be in full force for the complete term of the Contract including any warranty periods; and (7) be primary, and not in excess, to any insurance carried by State.

Waiver of Subrogation: When work is performed on State-owned or controlled property, the Workers' Compensation and Employers' Liability policy shall be endorsed with a waiver of subrogation endorsement in favor of the State. This endorsement shall also be provided.

C. Insurance Companies

(1) Insurance companies issuing any of the policies required by these provisions shall have a rating classification of "A-" or better and a financial size category rating of "vii" or better according to the latest edition of the A.M. Best Key Rating Guide. Any other rating classification requires State approval.

(2) All insurance companies issuing any of the policies required by these provisions shall be licensed to do business in the State of California.

D. Certificate of Insurance

(1) Concurrent with the execution of the Agreement, Contractor shall provide to State evidence that the insurance required to be

carried by these provisions, including any endorsement affecting the additional insured status, is in full force and effect and that premiums therefore have been paid. Such evidence shall be furnished on the insurance industry's standard ACORD Form (Certificate of Insurance) or a certified copy of the original policy, including all requirements set forth in this section.

(2) Contractor shall notify the State within 10 days of receipt of a notice of cancellation, expiration, or any reduction in coverage, or if the insurer commences proceedings or has proceedings commenced against it, indicating the insurer is insolvent. Contractor shall provide to State evidence of replacement policy at least ten (10) Working Days prior to the effective date of such cancellation, expiration, or reduction in coverage.

E. Contractor's Additional Responsibilities

(1) Contractor is responsible for any deductible or self-insured retention contained within the insurance program.

(2) Contractor shall ensure that all Subcontractors procure insurance meeting the requirements of these provisions.

F. State's Remedies – Should Contractor fail to keep the insurance required to be carried by these provisions in full force and effect at all times, State may, in addition to any other remedies State has, terminate this Contract immediately, and all payments due or that become due will be withheld, until notice is received by State that such insurance has been restored or replaced in full force and effect and that the premiums, therefore, have been paid to cover a period of time satisfactory to State.

1.05 STATE'S RIGHTS TO STOP PERFORMANCE AND/OR CARRY OUT WORK

A. State's Right to Stop the Work – If Contractor fails to correct the Work which is not in accordance with the requirements of the Contract Documents or fails to carry out the Work in accordance with the Contract Documents; or fails or refuses to provide a sufficient amount of properly supervised and coordinated labor, materials, or equipment so as to be able to complete the Work within the Contract Time; or disregards the instructions of State's Representative when based on the requirements of the Contract Documents; State may order Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; provided, however, the right of State to stop the Work shall not give rise to a duty on the part of State to exercise this right for the benefit of Contractor or any other person or entity and any delay resulting from such Work stoppage shall not extend any Milestone Date identified in the Contract or the required dates of Substantial or Final Completion.

B. State's Right to Carry Out the Work – If Contractor fails to carry out the Work in accordance with the Contract Documents and fails within a five (5) day period after written notice from State to eliminate (or commence to eliminate and thereafter work diligently to eliminate) such failure, State may, regardless of whether an Event of Default has occurred, and without prejudice to other remedies State may have, correct such deficiencies. In such case an offset may be made deducting from payments then or thereafter due Contractor the cost of correcting such deficiencies, including compensation for State's and State Representative's additional services and expenses made necessary by such default, neglect, or failure. If payments then or thereafter due Contractor are not sufficient to cover such amounts, Contractor shall promptly pay the difference to State on demand. The correction of such deficiencies by State or by others shall not relieve Contractor of any obligation or liability for the Work and shall not operate to waive any right or claim of State.

1.06 CONTRACTOR

A. Contractor's Construction Schedules

(1) Contractor agrees to complete the Work within the number of calendar days stated on the Bid Form from the date of written notice to commence Work. This time includes ten (10) Calendar Days allowed for Contractor to begin Work and ten (10) Calendar Days for issuance and completion of the Punch List. Upon written notice to proceed, Contractor shall begin Work and shall diligently prosecute the Work, with adequate forces, to completion within the Contract Time.

(2) Within ten (10) Calendar Days of the Notice to Proceed, Contractor shall furnish to State one (1) electronic copy and three (3) paper copies of a Critical Path Method (CPM) Project Work Schedule, in form and content satisfactory to State Representative and utilizing Microsoft Project software, presenting an orderly and realistic plan for completing the Work. The schedule shall include all scheduled Working Days, relevant work activities by trade and critical path dates. No activity on the schedule shall have a duration longer than 15 calendar days, with the exception of fabrication and procurement, unless otherwise approved. Within five (5) Working Days from the date the Project Work Schedule is furnished to State's Representative, State's Representative shall review and comment on the Project Work Schedule and approve or disapprove it, giving reasons for any disapproval. If disapproved, Contractor shall modify the Project Work Schedule and resubmit it for approval following the above stated timeframes. Additionally, Contractor shall submit one (1) electronic copy and three (3) paper copies of the updated

Critical Path Method (CPM) Project Work Schedule with each monthly Request for Payment. The Project Work Schedule shall be maintained at the work site and all revisions, along with the reasons therefore, as well as any affect on the critical path of the Work and the completion date, shall be furnished to State as soon as possible after the date of the revision, but in no event later than five (5) days after its revision.

(3) If the progress of the Work is behind the Project Work Schedule to such an extent that State reasonably determines that Contractor will be unable to meet any of the critical path dates set forth in the Project Work Schedule, including without limitation any Milestone Date, or Contractor fails to take prompt and adequate corrective action to State's satisfaction to bring the progress of the Work in compliance with the Project Work Schedule, State may, in addition to any other right or remedy provided herein, proceed as provided in Sections 1.05, 1.07, and/or 1.11 of these General Conditions.

(4) Liquidated Damages:

a. Failure of Contractor to complete the Work within the Contract Time will result in damages being sustained by State. It is and will be extremely difficult and impracticable to determine the actual damage which State will sustain by reason of such delay. Therefore, Contractor shall pay to State, as liquidated damages, the sum of ONE THOUSAND DOLLARS ($1,000.00) for each and every Calendar Day's delay in finishing the Work under this Contract beyond the stipulated number of days, or any adjustments thereof. State may deduct liquidated damages from funds due or that become due Contractor. Execution of the Contract shall constitute acknowledgment by Contractor that Contractor has ascertained and agrees that State will suffer damages in the amount fixed herein.

b. Contractor shall not be assessed liquidated damages when the delay is caused by the failure of State or the owner of any utility to provide for removal or relocation of an existing utility, facility, or to perform work as indicated in the Contract Documents.

B. Shop Drawings, Product Data, and Samples

(1) Reference in the Contract Documents to any equipment, material, article, or process by specific brand, trade name, make, or catalog number, followed by the term "or approved equal", shall be regarded as establishing a standard of quality. In such cases Contractor may, subject to State's Representative's review and approval, substitute any other brand of equal quality, utility, and availability. State's Representative shall be the sole judge of equality and suitability of substitute materials. Contractor shall bear all costs and expenses, including, but not limited to, costs and expenses related to demonstrating equality or suitability of such substitute equipment, material, article or process, and any costs or expenses of changes or adjustments necessitated by such substitutions, including, but not limited to, those related to other parts of the Work or the Work of other contractors. State's Representative's approval of any substitution shall not relieve Contractor from compliance with all requirements of the Contract Documents. Where the Contract Documents do not specifically permit the use of "approved equals" for any equipment, material, article, or process referred to by specific brand, trade name, make or catalog number, no substitutions shall be permitted except by means of the Change Order procedures as set forth in Section 1.08 of these General Conditions.

(2) Contractor shall not be relieved of responsibility for any deviations from requirements of the Contract Documents or allowed any additional compensation by reason of State's Representative approval of Shop Drawings, Product Data, Samples or similar submittals unless Contractor has specifically informed State's Representative in writing of such deviation at the time of submittal and fully complied with Section 1.08 of these General Conditions, and State's Representative has given written approval to the specific deviation. If Shop Drawings provide detail not shown in Contract Documents, Contractor shall be deemed to have primary design-build responsibility for such items. Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals by State's approval thereof.

C. Safety and Clean-Up – Contractor acknowledges that State will continue to occupy and must maintain continuous operations in the Parks in which the Work is located. It is critical that these operations shall not suffer any significant interference, including, without limitation, any interruption in utilities or unreasonable noise, dust, odor, or vibration. Contractor shall perform the Work and limit its use of the Project site in such a manner as to minimize any interference with occupancies and operations in such Parks and in accordance with applicable Park rules and regulations. Contractor shall be liable for all costs for all claims related to dust, mud, noise, odor, vibration, or windblown materials attributed to the Work hereunder.

D. Potential Subcontractors

Nothing contained in this agreement or otherwise, shall create any contractual relation between State and any subcontractors, and no subcontract shall relieve Contractor of its responsibilities and obligations hereunder. Contractor agrees to be as fully responsible to State for the acts and omissions of its subcontractors and of persons either directly or indirectly employed by any of them as it is for the acts and omissions of persons directly employed by Contractor. Contractor's obligation to pay its subcontractors is an

independent obligation from State's obligation to make payments to Contractor. As a result, State shall have no obligation to pay or to enforce the payment of any moneys to any subcontractor.

E. Force Majeure

Except for defaults of subcontractors, neither party shall be responsible for delays or failures in performance resulting from acts beyond the control of the offending party. Such acts shall include but shall not be limited to acts of God, fire, flood, earthquake, other natural disaster, nuclear accident, strike, lockout, riot, freight embargo, public regulated utility, or governmental statutes or regulations superimposed after the fact. If a delay or failure in performance by Contractor arises out of a default of its subcontractor, and if such default of its subcontractor, arises out of causes beyond the control of both Contractor and subcontractor, and without the fault or negligence of either of them, Contractor shall not be liable for damages of such delay or failure, unless the supplies or services to be furnished by subcontractor were obtainable from other sources in sufficient time to permit Contractor to meet the required performance schedule.

1.07 ADMINISTRATION OF THE CONTRACT

A. Claims and Disputes

(1) Time Limits on Contractor Claims: Except where a shorter time period is provided herein, claims by Contractor arising during the course of construction, including claims for additional costs, must be made within five (5) days after occurrence of the event giving rise to such claim or within five (5) days after Contractor first recognizes or reasonably should have recognized the condition giving rise to the claim. Claims must be made by written notice to State within five (5) days following such event.

(2) Continuing Contract Performance: Contractor, in the event of any claim or dispute with State over any matter whatsoever, shall not cause any delay or cessation in Contractor's Work and shall proceed with all Work called for in the Contract Documents and/or required to complete the Project.

(3) Claims for Additional Cost: If Contractor wishes to make a claim for an increase in the Contract Sum, written notice as provided herein shall be given before proceeding to execute the Work. Said notice shall itemize all claims, shall differentiate between extra work and base contract work, and shall contain sufficient detail and substantiating data to permit evaluation of same by State's Representative. Any change in the Contract Sum resulting from such approved claim shall only be authorized by a Change Order.

(4) Claims for Additional Time: If Contractor wishes to make claim for an increase in the Contract Time, written notice as provided herein shall be given. Contractor's claim shall include an estimate of cost and the probable effect of delay on progress of the Work and shall document any adverse effect on the Project Work Schedule. In the case of a continuing delay, only one claim is necessary.

(5) Claim Certification: Any claim for additional cost or time must include the following certification, signed by the Contractor's legal representative: "I certify under penalty of perjury, according to the Laws of the State of California, that this claim is made in good faith, that the supporting documentation is accurate and complete, and that the amount requested accurately reflects the contract adjustments for which the Department is responsible."

(6) Delays in and Extensions of Time:

a. If (a) Work on the critical path as shown on the Project Work Schedule is delayed at any time by (i) an act or neglect of State, any employee of State, or any separate contractor employed by State, (ii) changes ordered in the Work in accordance with the provisions of Article 7, (iii) unusually severe and/or abnormal weather conditions which preclude the safe performance of the Work, (iv) national conflicts or priorities arising therefrom, (v) fires beyond the reasonable control of Contractor, (vi) floods beyond the reasonable control of Contractor, (vii) earthquakes, (viii) off-site or area-wide labor disputes which are beyond the reasonable control of Contractor, (ix) civil disturbances and for no other cause or causes; (b) Contractor would otherwise have been able timely to perform its obligations under the Contract Documents but for such delay; (c) Contractor has taken reasonable precautions to foresee, prevent and to mitigate the effects of delays to Work on the critical path due to such causes; and (d) Contractor has given written notice as required by Section 1.08 of these General Conditions; then subject to the provisions of Section 1.07 of these General Conditions, the Contract Time shall be appropriately extended by Change Order by the number of Working Days of delay on the critical path of the Work actually and directly caused by such occurrence. Such extension of Contract Time shall be net of any delays caused by or due to the fault or negligence of Contractor or which are otherwise the responsibility of Contractor or its agents or Subcontractors, and shall also be net of any contingency or "float" time allowance included in the Project Work Schedule. State may, at its option, authorize extra Work in order to accelerate the Project Work Schedule and minimize or eliminate the impact of the delay. No extension shall be made or allowed nor shall such extra Work be authorized unless a written request therefor by Contractor is made within five (5) Calendar Days after the first occurrence of the delay. Any claims of Contractor relating

to time shall be made promptly in accordance with the applicable provisions of Section 1.08 of these General Conditions, or shall be deemed waived.

b. If adverse weather conditions are the basis for a claim for additional Contract Time, such claim shall be documented by data substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that weather conditions had a direct and adverse effect on scheduled critical path activities.

c. Adjustments in compensation for delays or time extensions will be allowed only for the causes specified in (i) and (ii) of paragraph 1.07A(6)a above, which extend the overall project duration.

(7) Disputes Resolution: A claim or dispute arising out of or relating to the Contract Documents which is not disposed of by agreement between Contractor and State shall be decided by State's Representative promptly, but not longer than ten (10) Working Days from the date Contractor notifies State's Representative in writing that agreement on a dispute cannot be reached and a written decision from State's Representative is required. The decision of State's Representative shall be final and conclusive on Contractor unless, within fifteen (15) days from the receipt of such decision, Contractor submits to State's Representative a written request for review of the decision made by State's Representative. The Director, or a designee other than State's Representative, shall review all decisions and render a decision in writing on or before thirty (30) days from the date of receipt of written position statements by Contractor and State's Representative as provided for herein. Contractor and State's Representative shall be afforded an opportunity to be heard by way of written submissions and to offer relevant information with respect to the matter in question.

(8) Decision of Director is Final: The decision of the Director or her or his designee shall be final and conclusive on Contractor, unless, within fifteen (15) Working Days from receipt of such decision, Contractor submits to State's Representative a written notice of Contractor's election to reserve its rights to file a claim with the State Board of Control and seek further adjudication of such claim should such claim be rejected by the State Board of Control.

(9) Arbitration: Claims (demands for monetary compensation of damages) arising out of related to the Contract Documents shall be resolved by arbitration unless State and Contractor agree in writing, after the claim has arisen, to waive arbitration and to have the claim litigated in a court of competent jurisdiction. Arbitration shall be pursuant to California Public Contract Code, Section 10240 et seq., and applicable regulations, Title 1, California Code of Regulations, Section 301 et seq. The arbitration decision shall be decided under and in accordance with the laws of the State of California, supported by substantial evidence and, in writing, contain the basis for the decision, findings of fact, and conclusions of law. Arbitration shall be initiated by a Demand for Arbitration made in compliance with the requirements of above referenced regulations. A Demand for Arbitration by Contractor shall be made not later than 180 days after date of service in person or by mail on Contractor of the final written decision by State on the claim. (This Section only applies to Contracts that exceed $117,000.00.)

(10) Exhaust All Administrative Remedies: Contractor must exhaust all remedies and comply with all disputes resolution procedures set forth in the proceeding section prior to filing any legal action which names the Department of Parks and Recreation, State of California, or any officer, employee, agent or affiliate of any of them. In no event, may Contractor bring any claims or pursue legal action for damages or other remedies for issues or matters not raised and presented in written notifications as provided for in the Contract Documents and as set forth in all written requests for review by State's Representative.

1.08 CHANGES IN THE WORK

A. Change Orders (Amendments) – When adjustments in the Contract Sum and Contract Time are determined, such determination shall be effective immediately and shall be recorded by preparation and execution of an appropriate Change Order. A Change Order signed by Contractor indicates Contractor's final and binding agreement therewith, including the adjustment in the Contract Sum or the Contract Time. No Change Order shall authorize an adjustment in the Contract Sum or Contract Time unless such Change Order specifies such adjustment. If no adjustment in either or both the Contract Sum and the Contract Time is specified, Contractor's execution of the Change Order shall constitute Contractor's agreement that no such adjustment shall be made. Contractor agrees that in no event shall it make any subsequent claim relating to the items covered by an executed Change Order, whether direct, indirect, or consequential in nature. All Change Orders are subject to the approval by the Department of General Services, if required.

B. Bulletins and Field Orders

(1) A Bulletin or Field Order shall not be recognized as having any impact upon the Contract Sum or the Contract Time. Contractor shall have no Claim therefor unless, within five (5) days from the date such direction or order was given, Contractor submits a written Change Order Request to the State's Representative with estimates of any adjustment in the Contract Sum or Contract Time to which Contractor believes it is entitled as a result of the change in the Work described in the Bulletin or Field Order, including sufficient detail to allow evaluation by the State's Representative.

(2) Upon receipt of a Bulletin or Field Order, Contractor shall promptly proceed with the Work involved, or as otherwise directed by the Bulletin or Field Order.

C. Pricing Changes

(1) When submitting its change proposal, Contractor shall include and set forth in clear and precise detail, breakdowns of labor, materials and allowable costs for all trades involved and the estimated impact on the Project Work Schedule. If requested by State, Contractor shall furnish spread sheets from which the breakdowns were prepared, plus spread sheets, if requested, of any Subcontractors. Allowable costs to be included in Contractor's change proposal shall be strictly limited to those set forth in Section 1.08C(2) of these General Conditions.

(2) In the event that (a) State approves a Change Order to be priced on a time and material basis, (b) State issues a Field Order to proceed with a change in the Work, Contractor timely notifies State of Contractor's belief that it is entitled to an adjustment in the Contract Sum or the Contract Time as a result of such change, and State and Contractor cannot agree on the amount of such adjustment, (c) Contractor is entitled to compensation as the result of a concealed condition, or (d) the Contract Sum includes allowances, then the amount of Contractor's allowable costs shall be governed by this Subsection. Allowable costs include and shall be strictly limited to the following:

a. The actual and reasonable cost of additional materials required as a result of such change, purchased by Contractor (or any Subcontractor) and used in the Work, including sales taxes, freight and delivery charges.

b. Construction equipment costs shall be substantiated by vendor's invoices. In no event shall the cost of such items exceed (1) the average current wholesale prices at which the items are locally available in the quantities required, delivered to the site, less applicable cash or trade discounts or (2) the equipment rental rates in the Labor Surcharge and Equipment Rental Rates published by Caltrans; whichever is less. The allowable rate constitutes full compensation to the Contractor including cost of fuel, oil, lubrication, supplies, necessary attachments, repairs, maintenance, depreciation, storage, insurance, labor except for construction equipment operators, and incidentals. No costs will be allowed for time while construction equipment is inoperative, idle or on standby, unless approved by the State.

c. Labor costs including welfare and fringe benefits shall be the actual labor cost, required as a result of such change in the Work, including no more than one (1) working foreman, but not including any supervisory or administrative personnel. Labor costs shall not exceed the local prevailing wage, which includes the Straight-Time Total Hourly Rate plus Burden. Burden shall be limited to the actual FICA-OASDI, FUTA, SUI, and Workers' Compensation payment percentages multiplied by the sum of the Basic Hourly Rate and Vacation/Holiday payments. Labor costs shall be substantiated by daily time cards (signed by Contractor's Superintendent) and labor summaries.

d. The cost of Work performed by Subcontractors or sub-Subcontractors is based on the actual direct costs of material, labor, and construction equipment and is determined pursuant to the provisions of this Subsection.

e. For deleted Work otherwise required to be performed hereunder, the Contract Sum shall be reduced by an amount equal to the net savings to Contractor and all Subcontractors and sub-Subcontractors on account of the deleted work for material, labor, and construction equipment.

(3) Failure of Contractor and State to agree on an adjustment of the Contract Sum or extension of Contract Time for performance under the Contract Documents shall not excuse Contractor from proceeding with the prosecution and performance of the Work as changed. State shall have the right within its sole discretion to require Contractor to commence performance of changes to the Work. If Contractor and State cannot agree on an appropriate stipulated sum for any change, the adjustment to the Contract Sum, if any, shall, subject to the provisions of Section 1.08 of these General Conditions, be determined by State on the basis of the allowable costs incurred as a result of such change as set forth in Section 1.08C(2) plus a fee as set forth in Section 1.08C(4).

(4) In addition to the allowable costs incurred for a change, Contractor (and any Subcontractors) is entitled to a fee. Such fee shall be included in any agreed upon stipulated sum for the Change Order and shall be added to the allowable costs for Change Orders priced on a time and material basis or as to which no agreement is reached. The additional fee shall be Contractor's (and Subcontractor's) sole reimbursement for overhead, profit and any other cost (including insurance required in the Contract Documents) not specifically reimbursable under the Contract for Construction. No such fee shall be applied to gross receipts or use tax amounts or bond premiums paid by Contractor. The following fees shall apply to Contractor and all Subcontractors and represent the maximum fees chargeable on each Contract tier, who shall receive mark-ups for all categories on a percentage basis equal to Contractor's Fee stated in the Contract:

a. For Work to be performed by Subcontractors, such Subcontractors, cumulative of all tiers, shall be permitted an additional fee of fifteen percent (15%) of the allowable costs incurred by such Subcontractors;

b. For Work to be performed by Contractor's own forces, Contractor shall be permitted an additional fee in the amount of fifteen percent (15%) of the allowable costs incurred directly by Contractor;

c. For Work to be performed by Subcontractors, Contractor shall be permitted an additional fee in the amount of five percent (5%) of the sum of the allowable costs incurred by Subcontractors plus the allowance for Subcontractors' fee provided in Subsection 4(a) above.

1.09 PAYMENTS AND COMPLETION

A. Schedule of Values – The apparent low bidder, within ten (10) days, not including Saturdays, Sundays, and Legal Holidays, after receiving notice that he/she is the apparent low bidder, shall submit along with the contract documents a complete itemized Schedule of Values that includes, but is not necessarily limited to, the cost of each line item equal to or greater than one and one-half percent of the contractor's total bid and every work item (activity) shown on the Contract Critical Path Method (CPM) Project Work Schedule. The sum of the cost of all activities in the Schedule of Values shall equal the Contract Amount. Contractor's mobilization, profit, fees, taxes, overhead and General Conditions must be itemized separately and not be prorated across other categories. The Schedule of Values, when approved by State's Representative, shall be used to monitor the progress of the Work and as a basis for payment requests. Each item shall show its total Scheduled Value, value of previous applications, value of the application, percentage completed, total value completed and value yet to be completed. All blanks and columns must be filled in, including every percentage complete figure. Contractor is to add approved Change Orders (Amendments) to the Schedule of Values on a monthly basis.

B. Request for Payment – Contractor shall submit to State an itemized request for payment no more than once each 30 day period for operations completed in accordance with the Schedule of Values. Such request shall be supported by such data substantiating Contractor's right to payment as State's Representative may require, such as copies of requisitions from Subcontractors and material suppliers, and reflect retainage. Any allowance included in the request for payment shall be separately itemized with supporting data attached. Progress payments for mobilization shall not exceed that authorized in Section 10264 of the Public Contract Code. Contractor shall furnish with each request for payment:

(1) Cost data to support the application, including without limitation, copies of Subcontractor's pay requests accurately reflecting current percentage of completion on a line-item basis.

(2) One (1) certified copy of all payroll records for the month.

(3) One (1) electronic copy and three (3) paper copies of the updated Project Work Schedule reflecting the current status of the project.

(4) One (1) originally signed Unconditional Waiver and Release Upon Progress Payment for all Subcontractor work paid to date.

C. Retention

(1) Five percent (5%) shall be retained from each progress payment and held by State. After the Punch List has been issued, retainage remains at five percent (5%) of all amounts billed or two (2) times the value of the Punch List Work, whichever is more, until Final Completion of the Work.

(2) Contractor may elect, upon prior notice to State, to retain additional sums, over the five percent (5%) required, from a Subcontractor. If, however, such additional retainage is made, then an equal amount shall be retained by State from Contractor.

(3) Section 10263 of the Public Contract Code pertaining to security deposits in lieu of retentions is incorporated, herein, in full by this reference. Pursuant to that Section, Contractor may, for contracts subject to the State Contract Act, request substitution of eligible securities for such retentions prior to issuance of original contract documents. Contractor hereby agrees to execute said securities using a State-furnished standard escrow agreement.

D. Substantial Completion

(1) Substantial Completion is the stage in the progress of the Work when, exclusive of Punch List items, the Work or designated portion thereof (which State agrees to accept and occupy and utilize separately) is sufficiently complete in accordance with the Contract Documents so State can legally and practically occupy and utilize the Work for its intended use, except for Work outside the scope of the Contract Documents.

(2) Objections to Certificate of Substantial Completion (DPR 248)/Notice of Completion (DPR 249): Contractor shall have seven (7) Working Days after receipt of the Certificate of Substantial Completion (DPR 248) during which Contractor may make written objection to State as to provisions of the Certificate of Substantial Completion and Punch List. If, after considering such objection, State concludes that the Project is not substantially complete, State shall, within seven (7) days after submission of the objection notify the Contractor thereof in writing stating the reasons. Upon Contractor's completion of the items listed on the Punch List and upon satisfaction of the terms and conditions of the Certificate of Substantial Completion, State shall issue a final

Notice of Completion (DPR 249), which shall fix a date as may be necessary or appropriate. State's determination of the Date of Substantial Completion and other items under this paragraph shall be final and conclusive on Contractor.

E. Partial Occupancy or Beneficial Use

(1) State and its lessees and separate Contractors may occupy or use any completed or partially completed portion of the Work at any stage of construction regardless of whether the Contract Time has expired (hereinafter sometimes referred to as "Partial Occupancy"). Such Partial Occupancy may commence whether or not the applicable portion of Work is substantially complete.

(2) It shall be understood, however, that Partial Occupancy shall not: (a) constitute final acceptance of any Work; (b) relieve Contractor for responsibility for loss or damage because of or arising out of defects in, or malfunctioning of, any Work, material, or equipment, or from any other unfulfilled obligations or responsibilities under the Contract Documents; or (c) commence any warranty period under the Contract Documents, provided that Contractor shall not be liable for ordinary wear and tear resulting from such Partial Occupancy.

F. Testing, Inspection, Final Inspection, and Acceptance

(1) Testing, inspection, and approval of portions of the Work required by the Contract Documents shall be made by an independent Testing Laboratory arranged and paid for by the Contractor and approved by the State. Contractor shall promptly furnish two certified copies of test results and inspection records to the State Representative. Material and equipment shall not be incorporated into the project until test results indicate conformance to the Contract Documents.

(2) Authorized employees of State shall have access to the Work at all times. Contractor shall give State's Representative forty-eight (48) hours advance notice of what Work and when the Work will be ready for inspection. Contractor shall provide proper facilities for such access and inspection. Inspection of the Work shall not relieve Contractor of any obligations to fulfill the Contract as prescribed. Any Work covered or concealed by Contractor before approval by State's Representative, shall, if required to be uncovered for examination and recovered, be at Contractor's sole expense.

(3) When the Work is completed, Contractor shall notify State's Representative and shall request final inspection. Within five (5) Calendar Days, State's Representative shall make final inspection. Contractor shall be notified in writing of any deficiencies (Punch List). Contractor shall remedy these deficiencies to complete satisfaction of State. After all the Work under this Contract has been completed and is so certified by State's Representative, formal acceptance will be made in writing by State by filing a Notice of Completion (DPR 249) for recording in the county in which the Work was performed.

1.10 UNCOVERING AND CORRECTION OF WORK

Correction of Work – If, within one (1) year after the date of Final Completion of the entire Work, or within such longer period of time as may be prescribed by laws or in equity or by terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be defective or otherwise not in accordance with the requirements of the Contract Documents, Contractor shall correct it promptly after receipt of written notice from State to do so unless State has previously given Contractor a written acceptance of such condition. Corrective Work shall be warranted to be free from defects for a period equal to the longer of six (6) months after the completion of the corrective Work or one (1) year after the Date of Final Completion or such longer period of time as may be prescribed by law or in equity, or expiration of the term of any applicable special warranty required by the Contract Documents whichever is longer. Any defect in such Work shall be corrected again by Contractor promptly upon written notice of the defect from State. The obligations under Section 1.10 of these General Conditions shall survive acceptance of the Work under the Contract for Construction and termination of the Contract for Construction. If Contractor fails to correct such Work, State may proceed to have the work corrected at Contractor's expense and Contractor shall pay the cost thereof on demand.

1.11 TERMINATION OR SUSPENSION OF THE CONTRACT

A. Termination by Contractor

(1) Contractor may terminate in writing, the Contract in the manner provided in Section 1.11 of these General Conditions if the Work is entirely stopped for a continuous period of thirty (30) days through no act or fault of Contractor or a Subcontractor, sub-Subcontractor or their agents or employees or any other persons performing portions of the Work under contract with Contractor, for any of the following reasons:

a. Issuance of an order of a court or other public authority having jurisdiction.

b. An act of government, such as a declaration of national emergency, making material unavailable.

(2) If one of the above reasons exists, Contractor may, upon fourteen (14) days written notice to State's Representative, terminate the Contract, unless this reason is cured prior to the expiration of the notice period, and recover from State payment for Work properly executed in accordance with the Contract Documents, excluding any anticipated profits from uncompleted Work, and payment for costs directly related to Work thereafter performed by Contractor in terminating such Work, including reasonable demobilization charges, provided said Work is authorized in advance by State's Representative and State.

B. Termination by State

(1) State may terminate the Contract if State deems any of the following conditions to exist:

a. Contractor refuses or fails to supply enough properly skilled workers or proper materials or equipment.

b. Contractor fails to make prompt payment to Subcontractors for materials or equipment or labor in accordance with the respective agreements between Contractor and Subcontractors.

c. Contractor disregards laws, ordinances, or rules, regulations, or orders of a public authority having jurisdiction, including, without limitation, environmental rules and regulations and health and safety codes.

d. Contractor disregards the instructions of State's Representative (when such instructions are based on the requirements of the Contract Documents).

e. In accordance with applicable law, and if permitted by such law, Contractor is the subject of a voluntary or involuntary petition in bankruptcy, or makes a general assignment for the benefit of Contractor's creditors, or a trustee or receiver is appointed for Contractor or for any of its property, or files a petition to take advantage of any debtor's act, or to reorganize under bankruptcy or similar laws.

f. Contractor has all or substantially all of its assets, equipment, or materials in any way connected with the work, executed upon or judicially seized, when such attachment or seizure remains undismissed for seven (7) days after levy thereof.

g. Contractor has imposed against it a federal or state tax lien.

h. Contractor fails to diligently prosecute the Work and/or correct deficiencies.

i. Contractor fails to maintain the proper license to perform the Work prescribed by this Contract.

(2) When any of the above reasons exist, State may, without prejudice to any other rights or remedies of State and after giving Contractor and Contractor's surety, if any, seven (7) days prior written notice (except in cases of emergency, as reasonably determined by State), terminate the Contract and may:

a. Take possession of the site and Project and of all materials, equipment, tools, and construction equipment and machinery thereon owned, rented, or leased by Contractor; and

b. Finish the Work by whatever method State may deem expedient.

c. Tender completion of the Work to Contractor's surety, if any, in accordance with terms of the Performance Bond.

(3) When State terminates the Contract for one of the reasons stated in Subsection 1.11B(1) of these General Conditions, Contractor shall not be entitled to receive further payment until the Work is finished and a final accounting is completed as to the proper sums due Contractor under the terms of the Contract.

(4) To the extent the costs of completing Work, including compensation for additional professional services and expenses, exceed those costs which would have been payable to Contractor to complete the Work except for Contractor's default, Contractor will pay the difference to State. This obligation for payment shall survive termination of the Contract. Such costs incurred by State shall be determined by State.

C. Suspension by State for Convenience – State may, at any time, at will and without cause, suspend, delay, or interrupt any part of the Work or all the Work for any reason whatsoever for such period of time as State may determine by giving seven (7) days' prior written notice to Contractor specifying the part of the Work to be suspended, delayed, or interrupted and the effective date of such suspension, delay, or interruption, as the case may be. Contractor shall continue to perform the part of the Work not suspended, delayed, or interrupted and shall properly protect and secure the part of the Work so suspended, delayed, or interrupted, so far as is necessary in State's reasonable opinion. Notwithstanding Subsection 1.11B of these General Conditions, if any part of the Work is so suspended, delayed, or interrupted, Contractor shall be entitled to payment of reasonable standby fees (or at State's option, payment

for demobilization) and costs directly associated with protecting and securing the affected Work, provided said costs are authorized in advance by State's Representative. No payment shall be made by State, however, to the extent that such Work is, was, or could have been suspended, delayed, or interrupted under the Contract Documents or an equitable adjustment is made or denied under another provision of the Contract for Construction. In case of such suspension, delay, or interruption, State will issue a Change Order making any required adjustment to the Contract Time and/or the Contract Sum. For the remainder of the Work, the Contract Documents shall remain in full force and effect.

1.12 EMPLOYEES

For each phase and type of Work, Contractor shall employ journey level people skilled in their respective trades and skilled in the use of methods, tools, and appliances developed in order to obtain the highest quality of workmanship throughout the Project. Any person State may deem incompetent or disorderly must be promptly removed by Contractor and not re-employed on the Project.

1.13 PREVAILING WAGE

A. The Notice to Contractors stipulates the prevailing wage rates applicable to the classes of labor to be used on this Project.

B. Contractor shall abide by the laws and regulations set forth pursuant to California Labor Code, Sections 1720 et seq., and Title 8, California Code of Regulations, Section 16000 et seq.

1.14 TRAVEL AND SUBSISTENCE PAYMENTS

Contractor shall make travel and subsistence payments to each worker needed to execute the Work, as such travel and subsistence payments are defined in the applicable collective bargaining agreements filed in accordance with Labor Code Section 1773.8.

1.15 APPRENTICES

Special attention is directed to California Labor Code, Sections 1777.5, 1777.6, and 1777.7, and Title 8, California Code of Regulations, Section 200 et seq. Each Contractor and Subcontractor must, prior to commencement of the Public Works Contract, contact the Division of Apprenticeship Standards, 455 Golden Gate Avenue, San Francisco, California, 94102, or one of its branch offices to ensure compliance and complete understanding of the law regarding apprentices and specifically the required ratio thereunder. Responsibility for compliance with this section lies with the prime Contractor. For further information, the website for the Division of Apprenticeship Standards can be accessed at: www.dir.ca.gov .

1.16 SANITARY FACILITIES

Contractor shall provide potable drinking water, and sanitary toilet facilities for Contractor's workers unless the use of existing facilities is authorized by State's Representative. Contractor shall locate temporary facilities as directed by State's Representative and maintain such facilities in good repair and in a sanitary condition. Contractor shall remove such facilities completely at the conclusion of the Work.

1.17 OBSERVANCE OF PARK RULES AND REGULATIONS

The Work to be done is within the jurisdiction of the State Park System. All persons entering the premises for whatever reason are subject to the "Rules and Regulations" for the State Park System, as set forth in Title 14, California Code of Regulations, Division 3, Chapters 1 and 2. Any person who fails to observe these "Rules and Regulations" may be barred from further work in the State Park System.

1.18 RESPONSIBILITY FOR INJURY AND DAMAGE

A. Contractor shall be responsible for damage to or loss of property regardless of cause, or for injury or loss of life to persons employed on this Project and to the general public, which arise from operations under this Contract.

B. From the formal Start Work Date until formal acceptance of the Work, Contractor is responsible to save from injury and damage by whatever cause all of the Work under this Contract, except as provided in Section 7105 of the Public Contract Code. Contractor shall rebuild, restore, and/or repair any such injury or damage, at Contractor's sole expense, before formal acceptance.

C. State is hereby relieved at all times from an indebtedness or claim other than the Contract Sum.

1.19 COOPERATION BETWEEN CONTRACTOR AND STATE

A. When the Contract is approved, Contractor will be notified in writing by State of the formal Start Work Date, the Contract completion date, and the name and location of State's Representative responsible for inspection of the Work. Contractor shall start Work within ten (10) Calendar Days of the formal Start Work Date and diligently pursue the Work to completion.

B. If Work is suspended for more than three (3) Calendar Days "due to Contractor's actions" or "due to no fault of State," Contractor shall immediately inform State's Representative in writing as to the rescheduling of the Work.

C. Contractor shall be responsible for notifying the surety or sureties, furnishing bonds for the Contract, of all changes to the Contract.

D. No Work shall be done except on Working Days and during Regular Work Hours unless Contractor has submitted a written request to State's Representative not less then five (5) Calendar Days in advance of each occurrence and State has given written approval. State may reject, without further reason, any work done in violation of this Subsection.

1.20 PERMITS, LAWS, AND REGULATIONS

A. State shall obtain and pay for the permits as indicated in the Project Manual. Contractor is responsible for all other permits. Notwithstanding that State obtains any permits required for the Work, Contractor shall not be relieved of any responsibility for compliance with laws and codes, including without limitation, building codes, pertaining to the Work. Contractor shall pay all public utility usage charges, for utilities consumed during the Work, including any applicable connection charges, which apply to the Work.

B. No building permits from city or county governments are necessary for Work on State projects.

C. Contractor shall comply with the current edition of Title 24, California Code of Regulations, and the various safety orders and codes of the State of California where applicable.

D. All records of Contractor, subcontractors, and suppliers that pertain to the performance of the work or are necessary to determine or verify compensation, including, but not limited to, all documents used to prepare the bid shall be retained for a period of three years after final payment for examination or audit by the State. The State may examine and copy all records including, but not limited to, paper, electronic, and photographic documents.

1.21 STORAGE OF EQUIPMENT AND MATERIALS

A. State's Representative shall inform Contractor of the availability of suitable areas for the storage of Contractor's equipment and materials. Contractor shall maintain the storage of equipment and materials within the confines of the area designated by State's Representative.

B. Contractor shall store materials intended for use on this Project in such a manner that their quality and fitness for the Work will be preserved. When considered necessary by State, materials shall be stored so as to facilitate inspection. It shall be Contractor's responsibility to protect those stored items. All stored materials remain the property of the Contractor until such time as they are installed in their final position as intended in the Contract Documents.

C. Routes of hauling and parking vehicles and equipment beyond the limits of the existing roads shall be only as directed by State's Representative.

1.22 SITE CONDITIONS

A. State may furnish reports, surveys, or other information describing physical characteristics, legal limitations and utility locations for the Project site, and a legal description of the site. The furnishing of this information is for the convenience of Contractor only and shall not relieve Contractor from its duties under the Contract Documents in general. In performance of the Work, Contractor shall undertake such further investigations and studies as may be necessary or useful to determine subsurface characteristics and patent and concealed conditions. In connection with the foregoing, Contractor shall be solely responsible for locating (and shall locate prior to performing any Work) all utility lines, telephone company lines and cables, sewer lines, water pipes, gas lines, electrical lines, including, without limitation, all buried pipelines and buried telephone cables and shall perform the Work in such a manner so as to avoid damaging any such lines, cables, pipes, and pipelines. Utility points of connection and other site relationships referenced in the contract documents are diagrammatic in nature. The exact location and routing requirements are the responsibility of the Contractor and are subject to the approval of the State's Representative.

B. The Contractor shall visit the Project site and verify all existing conditions prior to preparing its bid, in accordance with Parts 1.01 and 1.02 of Section 00100 Public Works, Instructions to Bidders. No additional compensation will be allowed for any conditions described in the Contract Documents or reasonably anticipated from pre-bid examination and observation of the Project site.

C. Differing Site Conditions

(1) During the progress of the Work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the Contract or if unknown physical conditions of an unusual nature, are encountered at the site, Contractor shall promptly notify State in writing of the specific differing conditions before they are disturbed and before the affected Work is performed.

(2) Upon written notification, State's Representative will investigate the conditions, and if State's Representative determines that the conditions materially differ and cause change in the cost or time required for the performance of any Work under the Contract, an adjustment, excluding loss of anticipated profits, will be made and the Contract modified in writing accordingly. State's Representative will notify Contractor of its determination whether or not an adjustment of the Contract is warranted.

D. The construction area must be confined to the minimum space needed and be compatible with the ongoing Park Unit operations. The construction area, including all staging and laydown areas, must be approved by the State's Representative.

1.23 WARRANTIES

ALL WARRANTIES SHALL INCLUDE LABOR AND MATERIALS AND SHALL BE SIGNED BY THE MANUFACTURER OR SUBCONTRACTOR AS THE CASE MAY BE AND COUNTERSIGNED BY CONTRACTOR. ALL WARRANTIES SHALL BE ADDRESSED TO STATE AND DELIVERED TO STATE'S REPRESENTATIVE UPON COMPLETION OF THE WORK AND BEFORE OR WITH THE SUBMISSION OF REQUEST FOR FINAL PAYMENT.

1.24 AS-BUILT PLANS

Prior to acceptance, Contractor shall furnish to State's Representative a set of Contract plans in CAD (computer-aided drafting) format unless otherwise directed by State's Representative, clearly and legibly marked showing the location, as constructed, of all elements, features, components, and utilities. The as-built plans shall provide detailed information and reference dimensions locating all concealed elements, features, components, and utilities. Each sheet must be stamped "AS-BUILT", signed and dated by the Contractor.

1.25 PROTECTION OF PERSONS AND PROPERTY

A. Contractor shall comply with all air pollution control rules, regulations, ordinances, and statutes, which apply to any Work performed pursuant to the Contract, including, but not limited to, any air pollution control rules, regulations, ordinances, and statutes, specified in California Government Code, Section 11017.

B. Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss. Contractor shall provide all facilities and shall follow all procedures required by the Occupational Safety and Health Act (OSHA) including, but not limited to, providing and posting all required posters and notices and shall otherwise be responsible for all other mandatory safety laws.

C. Contractor shall not impose or permit loading upon any part of the Work, construction, site or upon or adjacent to the Work site, in excess of safe limits, or permit loading that will result in stress or damage to the structural, architectural, mechanical, electrical, or other components of the Work.

D. Hazardous Materials

(1) Contractor shall not cause or permit any "Hazardous Materials" [as defined in Section 1.27D(2) of these General Conditions] to be brought upon, kept or used in or about the Project site except to the extent such Hazardous Materials: (a) are necessary for the prosecution of the Work; and (b) are required pursuant to the Contract Documents; and (c) have been approved in writing by State. Any Hazardous Materials allowed to be used on the Project site shall be used, stored, and disposed of in compliance with all applicable laws relating to such Hazardous Materials.

(2) As used herein, the term "Hazardous Materials" means any hazardous or toxic substances, materials or wastes listed in the United States Department of Transportation Hazardous Materials Table, or listed by the Environmental Protection Agency as a hazardous substance, or as defined in the California Health and Safety Code, Section 25316, or any substances, materials or wastes that are or become regulated, identified, defined or listed under federal, state or local law, and all products containing such Hazardous Materials.

E. Spread of Exotic Biological Organisms – Before entering the park unit and at the conclusion of the Contract, all Contractors shall remove soil and organic materials from all motorized equipment used to transport or process soil or organic matter. Contractors shall clean the hull, motor, pumps, and accessories on all watercraft before entering the park unit and at the conclusion of the Contract.

SECTION 000802

SUPPLEMENTAL CONDITIONS

PART 1 - GENERAL

1.1 SUMMARY

A. The following requirements either amend or supplement the following sections

1. Section 00700 – General Conditions (DPR 483)

B. ADD the following paragraph to Section 00700 – General Conditions (DPR 483)

1.04 Insurance, A. Insurance Requirements, (2) Builder's Risk/Installation Floater:

Builders Risk Insurance shall be on an "all-risk" or equivalent policy form and shall include, without limitation, insurance against the perils of fire (with extended coverage) and physical loss or damage including, without duplication of coverage, theft, vandalism, malicious mischief, collapse, windstorm, false work, testing and startup, temporary buildings, and debris removal including demolition occasioned by enforcement of any applicable legal requirements, and shall cover reasonable compensation for the State's and Contractor's services and expenses required as a result of such insured loss.

WAIVED

ADD the following paragraph to Section 00700 – General Conditions (DPR 483), 1.04 Insurance, <u>(5) POLLUTION LIABILITY:</u>

Contractor shall maintain in force, at its own expense, Pollution Liability / Environmental Liability Insurance (covers areas of: asbestos / lead abatement, demolition, electrical, excavation / grading, plumbing, masonry, painting, roofing, DOD & DOE, transformer / PCBs, general contracting, environmental remediation, drilling, emergency response, industrial cleaning / maintenance, lab packing, mechanical, paving, Superfund, storage tank and utility, mold remediation and incidental fungus), with limits not less than one million dollars ($1,000,000) depending on exposure.

C. All testing referred to in the Contract Documents shall be made by an independent testing lab arranged and paid for by the Contractor and approved by the State's Representative.

END OF SECTION 000802

SECTION 000803

MINED PRODUCTS AND MATERIALS

PART 1 – GENERAL

1.1 DESCRIPTION

A. The following requirements supplement the General Conditions

B. Related Sections:

1. Section 033000 – Cast-In-Place Concrete
2. Section 311000 – Site Clearing
3. Section 312000 – Earth Moving
4. Section 312333 – Trenching and Backfilling
5. Section 321123 – Aggregate Base Course
6. Section 321216 – Asphalt Paving

PART 2 – PRODUCTS

2.1 MINED PRODUCTS AND MATERIALS

A. In accordance with provisions of §10295.5 of the Public Contract Code, no sand, gravel, aggregates, or other minerals produced from a surface mining operation subject to the Surface Mining and Reclamation Act of 1975 (Public Resources Code Section 2710, et. seq.), shall be purchased or utilized in the Work of this Contract, unless the operation is identified in the list published quarterly in the California Regulatory Notice Register pursuant to subdivision (b) of Section 2717 of the Public Resources Code. The list is also available through the State of California, Department of Conservation, Office of Mine Reclamation website at www.consrv.ca.gov/omr (AB 3098 List).

PART 3 – EXECUTION

3.1 CERIFICATE OF COMPLIANCE

A. Submit Signed Certificate Indicating:

1. No sand, gravel, aggregates, or other minerals produced from a surface mining operation subject to the Surface Mining and Reclamation Act of 1975 have been purchased or utilized in the Work of this Contract which have come from sites not currently identified in the list published quarterly in the California Regulatory Notice Register pursuant to subdivision (b) of §2717 of the Public Resources Code.
2. Indicate the California Mine Identification Number of each site from which products or materials have been purchased.

END OF SECTION 000803

SECTION 000804

DISPOSAL OF REFUSE

PART 1 - GENERAL

1.1 DESCRIPTION

A. Dispose of waste, debris, and rubbish resulting from the construction of the project.

B. If excess excavation spoils cannot be suitably disposed of on State property, as directed by the State's Representative, it shall be hauled away at the Contractor's expense.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION

3.1 REQUIREMENTS

A. Remove waste materials, debris, and rubbish from site and legally dispose of at public or private dumping areas off State property.

B. Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

1. Do not burn or bury rubbish and waste materials on project site.
2. Do not dispose of volatile wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.
3. Do not dispose of wastes into streams or waterways

END OF SECTION 000804

SECTION 000810

CONSTRAINTS AND MITIGATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. The following requirements supplement the General Conditions, Section 00700.

1.2 RELATED REQUIREMENTS

A. Section 015000 Temporary Facilities and Controls

B. Section 015639 Temporary Tree and Plant Protection

C. Section 311235 Storm Water Pollution Prevention Plan (SWPPP)

D. Section 329300 Plants

1.3 DEFINITIONS

A. Cultural Resource Specialist – State provided Archaeologist, Historian, and/or Native American representative.

B. Natural Resource Specialist – State provided Environmental Scientist, Environmental Services Intern, or similar qualified State employment classification.

C. DPR-approved Biologist – State provided person with a college degree in Biology, Botany, Animal Science, or closely related field has been vetted through the Department to have adequate knowledge and appropriate work experience to conduct botanical/wildlife surveys or to monitor a project site for environmental compliance purposes.

1.4 SUBMITTALS

A. Temporary Fencing: Contractor shall submit layout, materials, and installation detail.

B. Exclusion Fencing: Contractor shall submit layout, materials, and installation details.

PART 2 – PRODUCTS (Not used).

2.1 MATERIALS

PART 3 – EXECUTION

3.1 GENERAL CONSTRAINTS

A. In compliance with the environmental review documents and regulatory permits, the Contractor's operations are subject to the constraints and environmental protection measures that follow, as well as compliance with any and all constraints or environmental protection measures included in other sections of the Project Manual.

B. Environmental Documents and Permits - The Contractor shall receive all necessary environmental documents from the State's Representative and shall maintain a copy of each document at the construction site at all times, and shall be presented to personnel from another State, Federal, or local agency upon request.

C. Contractor shall contact State's Representative a minimum of 7 days prior to the start of construction, as well as prior to demolition, vegetation removal, or any ground-disturbing work, and/or work during dates outlined in 3.2 CULTURAL RESOURCE CONSTRAINTS or 3.3 NATURAL RESOURCE CONSTRAINTS below to schedule cultural and/or natural resource monitoring/surveys/flagging by Cultural/Natural Resource Specialists. Any ensuing directives from the Cultural/Natural Resource Specialist(s) in relation to need for interruption of specific Contractor work will be made through the State's Representative.

D. Contractor shall notify State's Representative about any proposed project changes, including but not limited to construction sites, staging and storage locations for vehicles, equipment, materials, and vehicle access routes, for review and approval by Cultural/Natural Resource Specialists a minimum of 5 days in advance of implementation.

E. Contractor shall ensure that State Resource Specialists and regulatory agency personnel have access to the site when the specialist(s) determine it necessary to monitor work and/or resources.

F. Contractor shall stage/store equipment and materials only in designated areas shown on the project plans or Contractor submittals. Staging and storage locations and access routes to designated locations shall be limited to paved surfaces or previously hardened surfaces to minimize soil compaction of native habitat. Care will be taken to avoid placing spoils in undisturbed areas or in wetland habitat. These areas shall be reviewed (in consultation with natural and cultural resource specialists) and approved by the State's Representative prior to use by the Contractor.

3.2 CULTURAL RESOURCE CONSTRAINTS

A. Cultural Resource monitoring shall be required during all ground-disturbing activities for new gate and associated electrical components.

B. In the event that previously unknown cultural resources (including but not limited to concentrations of dark soil, shell, bone, flaked stone, groundstone, or deposits of historic materials ([50+ years old] trash, foundations, etc.) are encountered during project construction by anyone:

   1. Work shall cease immediately at the location.
   2. Contractor shall immediately notify the State's Representative.
   3. Contractor shall not work in this area until receipt of written approval from the State's Representative to resume activity in the area of the discovery.
   4. Contractor shall be redirected to work in other project locations.

C. In the event that human remains are discovered:

   1. Work shall cease immediately in the area of the find and the Contractor shall immediately notify the State's Representative.
   2. Work will not resume in the area of the find until proper disposition is complete in accordance with §5097.98 of the California Public Resources Code.
   3. Contractor shall be redirected to work in other project locations until Contractor receives written approval from the State's Representative to resume activity in the area of the discovery.

3.3 NATURAL RESOURCE CONSTRAINTS

A. A Qualified Biologist shall be present throughout the initial clearing, grading and excavation activities. A Biological Monitor may be present upon completion of excavation activities.

B. A Qualified Biologist shall conduct a pre-construction training session for all employees, contractors, or personnel otherwise working on the Project site who will take part in any action within the Project boundaries prior to performing any work on-site. The Worker Environmental Awareness Program (WEAP) materials will detail protocols for avoidance of environmentally sensitive biological resources, applicable regulations, and consequences of violating State laws and regulations. The program shall consist of a presentation from the Qualified Biologist that includes a discussion of:

C. The Qualified Biologist/Biological Monitor shall have the authority to stop all work if any special-status species enters or is discovered within 250 feet of the active work zone. All work shall halt and not continue until the wildlife leaves the area on its own accord.

D. Excavation, trenching, and any work involving staging or storage or materials or equipment in the park will only be conducted during the dry season (after April 15 and before October 15) unless otherwise

approved by a DPR Environmental Scientist.

E. Nesting Birds:

Preconstruction Surveys for Nesting Birds (not including burrowing owl and Swainson's hawk). For construction activities occurring during the nesting season (generally February 1 to September 15), surveys for nesting birds shall be conducted by the DPR-approved biologist no more than 7 days prior to start of construction.

1. The survey area for raptor species (including raptors such as white-tailed kite and golden eagle) and migratory birds (including bank swallow and raptor species shall include the disturbance footprint plus a 500-foot and 150-foot buffer, respectively.
2. If an active nest is identified, a DPR-approved biologist will be present to set appropriate buffers and to monitor the active nest to ensure that nesting behavior is not adversely affected by the construction activity. Once the DPR-approved biologist has determined the young have fledged and left the nest, or the nest otherwise becomes inactive under natural conditions, construction activities within the buffer area can occur.

F. Riparian Brush Rabbit, Riparian Woodrat

1. Pre-construction surveys will be conducted by a DPR-approved biologist no more than 10 days prior to the start of work to determine if there are any riparian woodrat or riparian brush rabbit houses (lodges) present in the project footprint. Identified locations will be marked as sensitive, and a 250-foot non-disturbance buffer established depending on regulatory agency guidelines and restrictions. Contractor shall install high-visibility construction fencing around the sensitive habitat.

G. Valley elderberry longhorn beetle (VELB)

1. Prior to conducting all project-related activities, a State Parks-approved biologist will identify elderberry shrubs within a 15-foot buffer around the project site. If elderberry shrubs are found within 15 feet of the project footprint, flagging or fencing will be installed between the work area and the elderberry prior to construction at that location to ensure the elderberry is not inadvertently impacted.
2. If it is necessary to trim any elderberry shrubs prior to construction, trimming shall be limited to between November and February. A DPR approved biologist will survey stems for VELB exit holes prior to trimming. The removal of live branches or stems that are ≥ 1 inch in diameter will only be permitted if exit holes are not observed.
3. Dead branches ≥ 1 inch in diameter may be trimmed.

4. Elderberry shrubs may be tied back away from the construction area to ensure impacts are avoided during construction.
5. No elderberry shrubs shall be destroyed or removed as part of this project.

H. Trees

1. Certification: From a qualified arborist, that trees indicated to remain have been protected during construction according to DPR protection standards and sheets G0.04 through G0.07 of the plan set, that trees were promptly and properly treated and repaired if damaged.

I. Rare Plants

1. Prior to the start of construction, the Natural Resource Specialist will flag populations of valley broomrape located at the entrance to the Elderberry and Oak Grove Day Use Areas, as sensitive sites. Contractor shall avoid construction activity near the known populations to prevent inadvertent impact on these plants.

J. Contractor shall cover areas of excavation (e.g., pits, trenches, holes) overnight or during periods of inactivity. Routes of escape from excavated pits and trenches shall also be installed for wildlife that could potentially become entrapped.

1. These locations will be regularly inspected by the Contractor, throughout construction and immediately prior to filling.
2. Should any wildlife be discovered within an excavated area, the Contractor shall promptly contact the State's Representative and temporarily suspend all work at the excavation site until the entrapped animal can be safely relocated by the Natural Resource Specialist or Qualified Biologist.

K. Contractor shall implement the following measures to reduce the introduction and spread of non-native, invasive species:

1. All construction equipment used on this project shall be clean and free of soil and plant material before arrival at the project site and before leaving the park in order to prevent invasive plant seed dispersal.
2. Contractor shall remove all non-native, invasive plant species from disturbed areas prior to replanting.

L. Contractor shall minimize noise during construction through the use of best available techniques.

1. Contractor shall ensure that all internal combustion engines are equipped with a muffler of a type recommended by the manufacturer and that all equipment and trucks use noise attenuation devices, such as engine enclosures, acoustically attenuating shields or shrouds, intake silencers, ducts, etc. (DPR)

2. Contractor shall locate stationary noise sources (e.g. generators) and staging areas as far away as possible from sensitive receptors (e.g., visitors, staff, wildlife, and/or neighbors). If stationary noise sources must be located near sensitive receptors, Contractor shall muffle construction-related noise sources to the extent feasible and/or where practicable.

M. Work Limit-Vehicle Speed Limit. No vehicle conducting any action or movement on paved access roads may go over fifteen (15) miles per hour. No vehicle conducting any action or movement on dirt access roads may go over ten (10) miles per hour. No vehicle conducting any action or movement within staging areas or in Project action areas may go over five (5) miles per hour. Vehicles include but are not limited to tractors, excavators, skid-steers, personnel vehicles, pick-up trucks, and dump trucks.

N. Contractor shall keep the project area clear of trash to avoid attracting scavengers/predators. All food and garbage shall be placed in sealed containers and regularly removed from the site.

3.4 AIR QUALITY

A. Contractor shall post a publicly visible sign specifying the telephone number and person to contact regarding dust complaints. This person shall respond to complaints and take corrective action within 48 hours. The phone number of the Bay Area Air Quality Management District shall be visible to ensure compliance with Rule 402 (Nuisance). (DPR)

B. Contractor shall maintain all equipment engines in good condition, in proper tune (according to manufacturer's specifications), and in compliance with all State and Federal requirements.

C. All trucks hauling soil, sand, or other loose materials on public roads shall be covered or required to maintain at least two feet of freeboard.

D. Contractor shall apply water (e.g., using water truck) twice daily at sufficient quantities to prevent airborne dust from leaving the Project area. Watering shall be conducted in a manner that prevents any runoff.

E. Contractor shall sweep streets if visible soil material is carried out from the construction site.

3.5 WORK LIMITS

A. No construction activities may occur outside of defined work limits unless approved in writing by the State's Representative, in consultation with the Cultural and Natural Resource Specialists.

3.6 SITE CONDITIONS

A. If unforeseen cultural and/or natural resources are uncovered during execution of the work, the State's Representative will put activities on hold at that specific location, and Contractor(s) shall be redirected to work in other project locations. The State Resource Specialist will record and evaluate the find and implement avoidance, preservation, or recovery measures as appropriate in compliance with environmental law and State Parks' resource directives prior to State's Representative directing resumption of work at that specific location.

B. Contractor shall include in the project schedule, consideration of up to 5 calendar days down time for unforeseen conditions uncovered during execution of work that may require further resource analysis. Down time days must be approved by the State's Representative.

C. Following construction, Contractor shall restore all disturbed areas to pre-project contours to the maximum extent possible and revegetated using locally occurring native species and native erosion control seed mix, per the recommendations of the qualified biologist.

3.10 PROTECTION OF EXISTING RESOURCES

A. Contractor shall provide required protection, in areas identified on drawings or as directed by State's Representative to maintain integrity of the existing resources to be protected during the course of the project.

END OF SECTION 000810

SECTION 011000

SUMMARY

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Project information.
2. Work covered by Contract Documents.
3. Contractor's use of site and premises.
4. Specification and Drawing conventions.

B. Related Requirements:

1. Section 015000 "Temporary Facilities and Controls" for limitations and procedures governing temporary use of State's facilities.

1.2 PROJECT INFORMATION

A. Project Name: Campground and Day Use Improvements

B. Project Location: Caswell Memorial State Par

28000 S Austin Rd. Ripon CA 95366

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. The Work of Project is defined by the Contract Documents

B. Type of Contract:

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

1.4 CONTRACTOR'S USE OF SITE AND PREMISES

A. Unrestricted Use of Site: Contractor shall have full use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by State's right to perform work or to retain other contractors on portions of Project.

1.5 SPECIFICATION AND DRAWING CONVENTIONS

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

1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with,"

depending on the context, are implied where a colon (:) is used within a sentence or phrase.

2. Text Color: Text used in the Specifications, including units of measure, manufacturer and product names, and other text may appear in multiple colors or underlined as part of a hyperlink; no emphasis is implied by text with these characteristics.
3. Hypertext: Text used in the Specifications may contain hyperlinks. Hyperlinks may allow for access to linked information that is not residing in the Specifications. Unless otherwise indicated, linked information is not part of the Contract Documents.
4. Specification requirements are to be performed by Contractor unless specifically stated otherwise.

B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 011000

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

B. Related Requirements:

1. Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.2 DEFINITIONS

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

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.

1.3 ACTION SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form acceptable to State's Representative.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

    a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
    b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by State and separate contractors that will be necessary to accommodate proposed substitution.
    c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.

e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of State's Representatives and States.
h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project.
j. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. State's Action: State's Representative will notify Contractor of acceptance or rejection of proposed substitution within 14 days of receipt of request.

   a. Forms of Acceptance: Change Order, Construction Change Directive, or State's Supplemental Instructions for minor changes in the Work.
   b. Use product specified if State's Representative does not issue a decision on use of a proposed substitution within time allocated.

1.4 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.5 PROCEDURES

A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.6 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change:

1. Conditions: State's Representative will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, State's Representative will return requests without action, except to record noncompliance with these requirements:

    a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    b. Substitution request is fully documented and properly submitted.
    c. Requested substitution will not adversely affect Contractor's construction schedule.
    d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    e. Requested substitution is compatible with other portions of the Work.
    f. Requested substitution has been coordinated with other portions of the Work.
    g. Requested substitution provides specified warranty.

B. Substitutions for Convenience: Not Allowed.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 012500

SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for handling and processing Contract modifications. The terms “Change Order”, “Contract Modification”, and “Amendment” are synonymous.

1.2 MINOR CHANGES IN THE WORK

A. State Representative will issue Bulletins, defined as supplemental instructions authorizing Minor Changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.3 PROPOSED CHANGE ORDER (PCO)

A. State-Initiated Requests: State Representative will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. PCOs issued by State Representative are for information only. Do not consider them instructions either to stop work in progress or to execute the proposed change.
2. Within 15 days after receipt of a PCO, submit a change proposal indicating all cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity durations, start and finish times, and activity relationships. Use available total float before requesting an extension of the Contract Time.

B. Contractor - Change Order Request (COR) - : Contractor may propose changes by submitting a Change Order Request (COR).

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
4. Include an updated Contractor's Construction Schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

1.4 ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, base each Change Order proposal on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.

1. Include installation costs in purchase amount only where indicated as part of the allowance.
2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
3. Submit substantiation of a change in scope of work, if any, claimed in Change Order proposals related to unit-cost allowances.
4. State reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.

B. Submit requests for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the Purchase Order amount or Contractor's handling, labor, installation, overhead, and profit. Submit request within 10 days of receipt of the Contract Field Order (CFO) authorizing work to proceed on the allowance. The State has the option to reject requests submitted later than 10 days after such authorization.

1. Do not include Contractor's or subcontractor's indirect expense in the Change Order proposal cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
2. No change to Contractor's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.

1.5 CONTRACT FIELD ORDER (CFO)

A. Contract Field Order: The State may issue a Contract Field Order (CFO). A CFO instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Contract Amendment.

1. A CFO contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

1.6 CHANGE ORDER (CONTRACT AMENDMENT)

A. Submit a letter of authority indicating the Contractor's authorized representative for negotiation of cost and time adjustments, and the limits of their authority. On State's approval of a Contractor's Change Proposal, State will issue a Contract Amendment for signatures of State and Contractor.

PART 2 - PART2 – PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012600

SECTION 012900

PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.2 SCHEDULE OF VALUES

A. General: Submit Schedule of Values in accordance with GENERAL CONDITIONS.

B. Coordination: Coordinate preparation of the Schedule of Values with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with the project CPM Schedule.
2. Subschedules: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values correlated with each phase of payment.

C. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the Schedule of Values. Provide at least one line item for each Specification Section.

1. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide several line items for principal subcontract amounts, where appropriate.
2. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
3. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
4. Provide separate line items in the Schedule of Values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
5. Allowances: Provide a separate line item in the Schedule of Values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
6. Each item in the Schedule of Values and Applications for Payment shall be complete..

a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at Contractor's option.

7. Provide separate line items for profit, fees, taxes, overhead, and General Conditions.

8. Schedule Updating: Update and resubmit the Schedule of Values before the next Applications for Payment when Change Orders or Contract Field Orders result in a change in the Contract Sum.

1.3 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be sequentially numbered and consistent with previous applications and payments as certified by the State Representative and paid for by the State.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Transmittal: Submit three (3) signed original copies of each Application for Payment to the State.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

C. Administrative Items: Administrative actions, submittals , and update submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors.
2. Schedule of Values.
3. Contractor's Construction Schedule (preliminary if not final).
4. Submittals Schedule (preliminary if not final).
5. List of Contractor's staff assignments.
6. Copies of required permits.
7. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.

D. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.

2. This application shall reflect Certificates of Partial Substantial Completion issued previously for State occupancy of designated portions of the Work.

E. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. Project Record Documents (As-Builts).
5. Operation and Maintenance (O & M) Manuals.
6. Warranties.
7. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when the State took possession of and assumed responsibility for corresponding elements of the Work.

END OF SECTION 012900

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. RFIs.
4. Digital project management procedures.
5. Project meetings.

B. Related Requirements:

1. Section 017300 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.

1.2 INFORMATIONAL SUBMITTALS

A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

1.3 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

3. Make adequate provisions to accommodate items scheduled for later installation.

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

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

1.4 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

a. Indicate functional and spatial relationships of components of Architectural, structural, civil, mechanical, and electrical systems.
b. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to State’s Representative indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show Architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling, raised access floor, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light

fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.

3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Review: State's Representative will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If State's Representative determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, State's Representative will so inform Contractor, who shall make suitable modifications and resubmit.

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.

1.5 REQUEST FOR INFORMATION (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. State's Representative will return without response those RFIs submitted to State's Representative by other entities controlled by Contractor.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. State name.
2. State's Project number.
3. Name of State's Representative
4. State's Project number.
5. Date.
6. Name of Contractor.
7. RFI number, numbered sequentially.
8. RFI subject.
9. Specification Section number and title and related paragraphs, as appropriate.
10. Drawing number and detail references, as appropriate.

11. Field dimensions and conditions, as appropriate.
12. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
13. Contractor's signature.
14. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

C. State's Action: State's Representative will review each RFI, determine action required, and respond. Allow 15 days for State's response for each RFI. RFIs received by State's Representative after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of State's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. State's action may include a request for additional information, in which case State's time for response will date from time of receipt by State's Representative of additional information.
3. State's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify State's Representative in writing within five days of receipt of the RFI response.

D. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.

1. Project name.
2. Name and address of Contractor.
3. Name and address of State's Representative.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date State's response was received.

E. On receipt of State's action, update the RFI log and immediately distribute the RFI response to affected parties.

1.6 PROJECT MEETINGS

A. General: State's Representative will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

B. Preconstruction Conference: State's Representative will schedule and conduct a preconstruction conference before starting construction, at a time convenient to State and State's Representative.

1. Attendees: Authorized representatives of State, State's Representative, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Discuss items of significance that could affect progress, including the following:

a. Responsibilities and personnel assignments.
b. Tentative construction schedule.
c. Phasing.
d. Critical work sequencing and long lead items.
e. Designation of key personnel and their duties.
f. Lines of communications.
g. Procedures for processing field decisions and Change Orders.
h. Procedures for RFIs.
i. Procedures for testing and inspecting.
j. Procedures for processing Applications for Payment.
k. Distribution of the Contract Documents.
l. Submittal procedures.

m. Preparation of Record Documents.
n. Use of the premises
o. Work restrictions.
p. Working hours.
q. State's occupancy requirements.
r. Temporary facilities and controls.
s. Temporary fire protection.
t. Temporary environmental controls
u. Procedures for moisture and mold control.
v. Procedures for disruptions and shutdowns.
w. Construction waste management and recycling.
x. Parking availability.
y. Office, work, and storage areas.
z. Equipment deliveries and priorities.
aa. First aid.
bb. Security.
cc. Progress cleaning.

3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.

C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise State's Representative of scheduled meeting dates.

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

a. Contract Documents.
b. Options.
c. Related RFIs.
d. Related Change Orders.
e. Purchases.
f. Deliveries.
g. Submittals
h. Retain first subparagraph below for projects with sustainable design documentation requirements.
i. Review of mockups.
j. Possible conflicts.
k. Compatibility requirements.
l. Time schedules.
m. Weather limitations.
n. Manufacturer's written instructions.
o. Warranty requirements.
p. Compatibility of materials.
q. Acceptability of substrates.
r. Temporary facilities and controls.
s. Temporary fire protection
t. Temporary environmental controls
u. Space and access limitations.
v. Regulations of authorities having jurisdiction.
w. Testing and inspecting requirements.
x. Installation procedures.
y. Coordination with other work.
z. Required performance results.
aa. Protection of adjacent work.
bb. Protection of construction and personnel.

3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.

4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: State's Representative will conduct progress meetings at biweekly intervals.

1. Attendees: In addition to representatives of State and State's Representative, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

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

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.
        2) Sequence of operations.
        3) Retain first subparagraph below if Project uses BIM in construction stage.
        4) Status of submittals.

        5) Deliveries.
        6) Off-site fabrication.
        7) Access.
        8) Site use.
        9) Temporary facilities and controls.
        10) Temporary fire protection
        11) Temporary environmental controls

12) Progress cleaning.
13) Quality and work standards.
14) Status of correction of deficient items.
15) Field observations.
16) Status of RFIs.
17) Status of Proposal Requests.
18) Pending changes.
19) Status of Change Orders.
20) Pending claims and disputes.
21) Documentation of information for payment requests.

3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

   a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 013100

SECTION 013200

CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Contractor's Construction Schedule.
2. Construction schedule updating reports.
3. Daily construction reports.
4. Site condition reports.

1.2 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

D. Event: The starting or ending point of an activity.

E. Float: The measure of leeway in starting and completing an activity.

1.3 INFORMATIONAL SUBMITTALS

A. Format for Submittals: Submit required submittals in the following format:

1. Working electronic copy of schedule file.

2. PDF file.
3. Three paper copies, of sufficient size to display entire period or schedule, as required.

B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

C. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.

D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
3. Total Float Report: List of activities sorted in ascending order of total float.

E. Construction Schedule Updating Reports: Submit with Applications for Payment.

F. Daily Construction Reports: Submit at weekly intervals.

G. Site Condition Reports: Submit at time of discovery of differing conditions.

1.4 COORDINATION

A. Coordinate Contractor's Construction Schedule with the schedule of values, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.5 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

B. Time Frame: Extend schedule from date established for [the Notice to Proceed to date of final completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

C. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than 15 days, unless specifically allowed by State's Representative.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
3. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.

4. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for State's administrative procedures necessary for certification of Substantial Completion.
5. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.

D. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. State-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 011000 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
3. Work Restrictions: Show the effect of the following items on the schedule:

    a. Coordination with existing construction.
    b. Limitations of continued occupancies.
    c. Uninterruptible services.
    d. Partial occupancy before Substantial Completion.
    e. Use-of-premises restrictions.
    f. Provisions for future construction.
    g. Seasonal variations.
    h. Environmental control.

E. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion.

F. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.

2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and the Contract Time.

G. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

H. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

I. Distribution: Distribute copies of approved schedule to State’s Representative and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.6 GANTT-CHART SCHEDULE REQUIREMENTS

A. Gantt-Chart Schedule: Submit a comprehensive, fully developed, horizontal, Gantt-chart-type, Contractor's Construction Schedule within 10 days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line.

1.7 CPM SCHEDULE REQUIREMENTS

A. Prepare network diagrams using AON (activity-on-node) format.

B. CPM Schedule: Prepare Contractor's Construction Schedule using a time-scaled CPM network analysis diagram for the Work.

1. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.

2. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.

C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

   a. Preparation and processing of submittals.
   b. Mobilization and demobilization.
   c. Purchase of materials.
   d. Delivery.
   e. Fabrication.
   f. Utility interruptions.
   g. Installation.
   h. Work by State that may affect or be affected by Contractor's activities.
   i. Testing and inspection.
   j. Commissioning.
   k. Punch list and final completion.
   l. Activities occurring following final completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.

E. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.

2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

1.8 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.

15. Construction Change Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report.

Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

END OF SECTION 013200

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.

B. Absolutely no construction activity shall commence on submittal items or affected assemblies prior to the State's approval of contractors submittals.

C. Contractor shall upload and submit all electronic submittals through Procore project management software. State’s Rep will provide Procore tutorial for instruction on how to upload submittals to Procore.

1.2 DEFINITIONS

A. Action Submittals: Written and graphic information that requires the Designer's responsive action.

B. Informational Submittals: Written information that does not require the Designer's approval. Submittals may be rejected for not complying with requirements.

1.3 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. The State Representative reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

B. Submittals Schedule: Electronic copies of each submittal must be uploaded to Procore Project Management software and transmitted to the State Representative within 15 days of Notice To Proceed.

C. Processing Time: Allow enough time for submittal review, including time for resubmittals, as follows. Time for review shall commence on the Designer's receipt of submittal.

1. Initial Review: Allow 20 working days for initial review of each submittal. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The State will advise Contractor when a submittal being processed must be delayed for coordination.
2. If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Allow 15 working days for processing each resubmittal.
4. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.

D. Identification: Place a permanent label or title block on each submittal for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space on label or beside title block to record Contractor's review and approval markings and action taken by the State.
3. Include the following information on label for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name and address of Contractor.
    d. Name and address of subcontractor.
    e. Name and address of supplier.
    f. Name of manufacturer.
    g. Unique sequential identifier, including revision number.
    h. Number and title of appropriate Specification Section.
    i. Drawing number and detail references, as appropriate.
    j. Other necessary identification.

E. Deviations: Highlight, encircle, or otherwise identify in a manner acceptable to the State any deviations from the Contract Documents on submittals.

F. Additional Copies: Unless additional copies are required for final submittal, and unless the Designer observes noncompliance with provisions of the Contract Documents, initial submittal may serve as final submittal.

1. Additional copies submitted for maintenance manuals will not be marked with action taken and will be returned.

G. Transmittal: Package each physical sample submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form uploaded to Procore. Number each submittal sequentially and

date each submittal. The State Representative will return submittals, without review, from sources other than Contractor.

1. Include Contractor's certification stating that information submitted complies with requirements of the Contract Documents.
2. Transmittal Form: Use form approved by the State Representative.

H. Use for Construction: Use only final submittals with mark indicating action taken by the State in connection with construction.

PART 2 - PRODUCTS

2.1 ACTION SUBMITTALS

A. General: Prepare and submit in Procore all Action Submittals required by individual Specification Sections.

1. Number of Copies: Submit 1 electronic copy of each submittal. If physical samples are indicated, contractor will submit a coversheet in Procore for response. The State Representative will return physical samples. Mark up and retain one physical sample as a Project Record.

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard printed data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer's written recommendations.
    b. Manufacturer's product specifications.
    c. Manufacturer's installation instructions.
    d. Manufacturer's catalog cuts.
    e. Wiring diagrams showing factory-installed wiring.
    f. Printed performance curves.
    g. Operational range diagrams.
    h. Compliance with recognized trade association standards.
    i. Compliance with recognized testing agency standards.

C. Shop Drawings: Submit Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Include the following information, as applicable:

a. Dimensions.
b. Identification of products.
c. Fabrication and installation drawings.
d. Roughing-in and setting diagrams.
e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
f. Shopwork manufacturing instructions.
g. Templates and patterns.
h. Schedules.
i. Notation of coordination requirements.
j. Notation of dimensions established by field measurement.

2. Wiring Diagrams: Differentiate between manufacturer-installed and field-installed wiring.
3. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches but no larger than 30 by 40 inches.

D. Samples: Submit physical units of materials or products, including the following:
1. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

a. Submit three full set[**s**] of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. The State Representative will return submittal with options selected.

2. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from the same material to be used for the Work, cured and finished in manner specified, and physically identical with the product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

a. Submit three (3) sets of Samples. The State will retain **two** Sample sets; remainder will be returned. A submittal coversheet for each physical sample to be submitted through Procore for response.

3. Preparation: Mount, display, or package Samples in manner specified to facilitate review of qualities indicated. Submit Samples to match the State's sample where so indicated. Attach label on unexposed side.

4. Submit Samples for review of kind, color, pattern, and texture for a final check of these characteristics with other elements and for a comparison of these characteristics between final submittal and actual component as delivered and installed.
5. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

E. Product Schedule or List: Submit a written summary indicating types of products required for the Work and their intended location.

F. Application for Payment: Comply with requirements in Division 1 Section 01290 "Payment Procedures."

G. Schedule of Values: Comply with requirements in Section 00700 General Conditions.

2.2 INFORMATIONAL SUBMITTALS

A. General: Prepare and submit Informational Submittals required by other Specification Sections.

1. Number of Copies: Submit one (1) electronic copy of each submittal, unless otherwise indicated.
2. Certificates and Certifications: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

B. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements.

C. Environmental Product Declarations (EPD):

1. Per the Buy Clean California Act, Environmental Product Declarations (EPD) shall be submitted for the following items:
    - Concrete Reinforcing Steel: ASTM A615/A615M standard specification for carbon steel bars. ASTM A706/A706M standard specification for low-alloy steel bars. ASTM A767/A767M standard specification for zinc-coated steel bars. ASTM A775/A775M standard specification for epoxy-coated steel bars

    - Structural Steel: Hot-rolled sections consisting of wide flange beams (W-shape and HP-shape used in structural applications), standard beams (S-shape), misc. beams (M-shape), channels, an-

gles, and tees. Hollow structural sections with round, square, or rectangular cross-section. Plate material.

- Flat Glass: Float or rolled glass that is clear or tinted.
- Mineral Wool Board Insulation: Board insulation made of rock or slag in light- and heavy-density types. Light-density: 2.5 lbs/ft^3 – 4.3 lbs/ft^3 Heavy-density: 4.4 lbs/ft^3 – 8 lbs/ft^3 lbs/ft^3 is pounds per cubic foot

2. An EPD is an independently verified and registered document that reports a product's environmental impact over its life cycle.

3. An EPD must be:
   - A facility-specific manufacturer declaration
   - Independently verified in accordance with ISO 14025 (Type III environmental declarations – Principles and procedures)
   - Developed according to the guidelines of the applicable Product Category Rule (PCR) as identified by the State

4. Global Warming Potential (GWP) Limits for Eligible Material

Table 1: GWP limits for eligible materials

Eligible material	**Maximum acceptable GWP limit (unfabricated)***
Hot-rolled structural steel sections	1.01 MT CO_2 eq./MT
Hollow structural sections	1.71 MT CO_2 eq./MT
Steel plate	1.49 MT CO_2 eq./MT
Concrete reinforcing steel	0.89 MT CO_2 eq./MT
Flat glass	1.43 MT CO_2 eq./MT
Light-density mineral wool board insulation	3.33 kg CO_2 eq./1 m^2
Heavy-density mineral wool board insulation	8.16 kg CO_2 eq./1 m^2

D. Welding Certificates: Submit written certification that welding procedures and personnel comply with requirements. Submit record of Welding Procedure

Specification (WPS) and Procedure Qualification Record (PQR) on AWS forms. Include names of firms and personnel certified.

E. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.

F. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.

G. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements.

H. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements.

I. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

J. Field Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements.

K. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

L. Research/Evaluation Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project.

M. Maintenance Data: Submit written and graphic instructions and procedures for operation and normal maintenance of products and equipment.

N. Design Data: Submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

O. Manufacturer's Instructions: Submit written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer.

P. Manufacturer's Field Reports: Submit written information documenting factory-authorized service representative's tests and inspections.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Review each submittal and check for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to the State.

B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 DESIGNER'S ACTION

A. General: The Designer will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: The Designer will review each submittal, make marks to indicate corrections or modifications required, and return it. The Designer will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action taken:

C. Informational Submittals: The Designer will review each submittal and will return it, or will reject and return it if it does not comply with requirements. The State Representative will forward each submittal to appropriate party.

END OF SECTION 013300

SECTION 014000

QUALITY REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspection services are required by the Contractor to verify compliance with requirements specified or indicated.

1. The cost of failing tests shall be paid by the Contractor at no additional cost the State.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and quality-control services required by State’s Representative, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

A. Experienced: When used with an entity or individual, "experienced" unless otherwise further described means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.

1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).

D. Mockups: Full-size physical assemblies that are constructed on-site either as freestanding temporary built elements or as part of permanent construction. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size physical assemblies constructed and tested at testing facility to verify performance characteristics.
2. Integrated Exterior Mockups: Mockups of the exterior envelope constructed on-site as freestanding temporary built elements or as indicated in-place portions of permanent construction, consisting of multiple products, assemblies, and subassemblies, with cutaways enabling inspection of concealed portions of the Work.
3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes; doors; windows; millwork; casework; specialties; furnishings and equipment; and lighting.
4. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
5. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.

E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.

F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source; for example, plant, mill, factory, or shop.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall have the same meaning as testing agency.

I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by State’s Representative.

1.3 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by

the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to State's Representative.

B. Delegated-Design Services Statement: Submit a statement, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.4 CONFLICTING REQUIREMENTS

A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the State's Representative regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to State's Representative for clarification before proceeding.

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

1.5 ACTION SUBMITTALS

A. Mockup Shop Drawings: For mockups.

1. Include plans, sections, elevations, and details, indicating materials and size of mockup construction.
2. Indicate manufacturer and model number of individual components.
3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility submitted to authorities having jurisdiction before starting work on the following systems:

1. Seismic-force-resisting system, designated seismic system, or component listed in the Statement of Special Inspections.

2. Main wind-force-resisting system or a wind-resisting component listed in the Statement of Special Inspections.

B. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

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

1.7 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, telephone number, and email address of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspection.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Statement on condition of substrates and their acceptability for installation of product.
2. Statement that products at Project site comply with requirements.
3. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
4. Results of operational and other tests and a statement of whether observed performance complies with requirements.
5. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service

representative's tests and inspections specified in other Sections. Include the following:

1. Statement that equipment complies with requirements.
2. Results of operational and other tests and a statement of whether observed performance complies with requirements.
3. Other required items indicated in individual Specification Sections.

1.8 QUALITY ASSURANCE

A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar in material, design, and extent to those indicated for this Project.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented according to ASTM E329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.

H. Water Quality Testing Qualifications: An independent ELAP Certified Laboratory.

I. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

    a. Provide test specimens representative of proposed products and construction.
    b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    c. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    d. When testing is complete, remove test specimens and test assemblies, mockups, and laboratory mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to State's Representative, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by State's Representative.
3. Notify State's Representative seven days in advance of dates and times when mockups will be constructed.
4. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed to perform same tasks during the construction at Project.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain State's approval of mockups before starting corresponding work, fabrication, or construction.

    a. Allow seven days for initial review and each re-review of each mockup.

7. Promptly correct unsatisfactory conditions noted by State's preliminary review, to the satisfaction of the State's Representative, before completion of final mockup.
8. Approval of mockups by the State's Representative does not constitute approval of deviations from the Contract Documents contained in mockups unless State's Representative specifically approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.

10. Demolish and remove mockups when directed unless otherwise indicated.

L. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings and as indicated on Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials. Comply with requirements in "Mockups" Paragraph.

1. Coordinate construction of the mockup to allow observation of air barrier installation, flashings, air barrier integration with fenestration systems, and other portions of the building air/moisture barrier and drainage assemblies, prior to installation of veneer, cladding elements, and other components that will obscure the work.

M. Room Mockups: Construct room mockups according to approved Shop Drawings and as indicated on Drawings, incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable State's Representative to evaluate quality of the Work. Comply with requirements in "Mockups" Paragraph.

1.9 QUALITY CONTROL

A. State Responsibilities: Where quality-control services are indicated as State's responsibility, State will engage a qualified testing agency to perform these services.

1. State will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform.
2. Costs for retesting and reinspecting construction that replaces or is necessitated by Work that failed to comply with the Contract Documents will be charged to Contractor

B. Contractor Responsibilities: Tests and inspections not explicitly assigned to State are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Engage a qualified testing agency to perform quality-control services.

a. Contractor shall not employ same entity engaged by State, unless agreed to in writing by State.

2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.
3. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

D. Testing Agency Responsibilities: Cooperate with State's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify State's Representative and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected Work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform duties of Contractor.

E. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."

F. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

G. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify

agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Preliminary design mix proposed for use for material mixes that require control by testing agency.
6. Security and protection for samples and for testing and inspection equipment at Project site.

H. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

1.10 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: Contractor will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying State's Representative promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to State's Representative and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and reinspecting corrected Work.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1 TEST AND INSPECTION LOG

A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to State's Representative.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for State's and authorities' having jurisdiction reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspection, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 017300 "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

SECTION 014200

REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

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

B. "Approved": Approved by the State.

C. "Directed": A command or instruction by the State Representative. Other terms including "requested," "authorized," "selected," "approved," "required," and "permitted" have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Operations at Project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.

H. "Provide": Furnish and install, complete and ready for the intended use.

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

1. Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespeople of the corresponding generic name.

J. "Experienced": When used with an entity, "experienced" means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

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

L. "Submit": Deliver information in the specified format to the State for the State's review and approval.

1.2 INDUSTRY STANDARDS

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

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

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

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

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

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

E. Abbreviations and Acronyms for Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list:

ADAAG Americans with Disabilities Act (ADA)

CFR Code of Federal Regulations

CRD	Handbook for Concrete and Cement
DOD	Department of Defense Specifications and Standards
FED-STD	Federal Standard (See FS)
FS	Federal Specification
FTMS	Federal Test Method Standard (See FS)
MILSPEC	Military Specification and Standards
UFAS	Uniform Federal Accessibility Standards

1.3 ABBREVIATIONS AND ACRONYMS

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

B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

AA	Aluminum Association, Inc. (The)
AAADM	American Association of Automatic Door Manufacturers
AABC	Associated Air Balance Council
AAMA	American Architectural Manufacturers Association
AAN	American Association of Nurserymen (See ANLA)
AASHTO	American Association of State Highway and Transportation Officials
AATCC	American Association of Textile Chemists and Colorists (The)
ABMA	American Bearing Manufacturers Association
ACI	American Concrete Institute/ACI International
ACPA	American Concrete Pipe Association
ADC	Air Diffusion Council
AEIC	Association of Edison Illuminating Companies, Inc. (The)

References

AFPA	American Forest & Paper Association (See AF&PA)
AF&PA	American Forest & Paper Association
AGA	American Gas Association
AGC	Associated General Contractors of America (The)
AHA	American Hardboard Association
AHAM	Association of Home Appliance Manufacturers
AI	Asphalt Institute
AIA	American Institute of Architects (The)
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
ALA	American Laminators Association (See LMA)
ALCA	Associated Landscape Contractors of America
ALSC	American Lumber Standard Committee
AMCA	Air Movement and Control Association International, Inc.
ANLA	American Nursery & Landscape Association (Formerly: AAN - American Association of Nurserymen)
ANSI	American National Standards Institute
AOSA	Association of Official Seed Analysts
APA	APA - The Engineered Wood Association
APA	Architectural Precast Association
API	American Petroleum Institute
ARI	Air-Conditioning & Refrigeration Institute
ASCA	Architectural Spray Coaters Association
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers

ASME	ASME International (The American Society of Mechanical Engineers International)
ASSE	American Society of Sanitary Engineering
ASTM	American Society for Testing and Materials
AWCI	AWCI International (Association of the Wall and Ceiling Industries International)
AWCMA	American Window Covering Manufacturers Association (See WCMA)
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Industry Association (The)
BIFMA	BIFMA International (Business and Institutional Furniture Manufacturer's Association International)
CCC	Carpet Cushion Council
CCFSS	Center for Cold-Formed Steel Structures
CDA	Copper Development Association Inc.
CEA	Canadian Electricity Association
CFFA	Chemical Fabrics & Film Association, Inc.
CGA	Compressed Gas Association
CGSB	Canadian General Standards Board
CIMA	Cellulose Insulation Manufacturers Association
CISCA	Ceilings & Interior Systems Construction Association
CISPI	Cast Iron Soil Pipe Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPA	Composite Panel Association

	(Formerly: National Particleboard Association)
CPPA	Corrugated Polyethylene Pipe Association
CRI	Carpet & Rug Institute (The)
CRSI	Concrete Reinforcing Steel Institute
CSA	CSA International (Formerly: IAS - International Approval Services)
CSI	Construction Specifications Institute (The)
CSSB	Cedar Shake & Shingle Bureau
CTI	Cooling Technology Institute (Formerly: Cooling Tower Institute)
DHI	Door and Hardware Institute
EIA/TIA	Electronic Industries Alliance/Telecommunications Industry Association
EIMA	EIFS Industry Members Association
EJMA	Expansion Joint Manufacturers Association, Inc.
FCI	Fluid Controls Institute
FGMA	Flat Glass Marketing Association (See GANA)
FM	Factory Mutual System (See FMG)
FMG	FM Global (Formerly: FM - Factory Mutual System)
GA	Gypsum Association
GANA	Glass Association of North America (Formerly: FGMA - Flat Glass Marketing Association)
GRI	Geosynthetic Research Institute
GTA	Glass Tempering Division of Glass Association of North America (See GANA)
HI	Hydraulic Institute
HI	Hydronics Institute
HMMA	Hollow Metal Manufacturers Association (See NAAMM)
HPVA	Hardwood Plywood & Veneer Association

HPW	H. P. White Laboratory, Inc.
IAS	International Approval Services (See CSA International)
ICEA	Insulated Cable Engineers Association, Inc.
ICRI	International Concrete Repair Institute (The)
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical and Electronics Engineers, Inc. (The)
IESNA	Illuminating Engineering Society of North America
IGCC	Insulating Glass Certification Council
ILI	Indiana Limestone Institute of America, Inc.
IRI	Industrial Risk Insurers
ITS	Intertek Testing Services
IWS	Insect Screening Weavers Association (Now defunct)
KCMA	Kitchen Cabinet Manufacturers Association
LGSI	Light Gage Structural Institute
LMA	Laminating Materials Association (Formerly: ALA - American Laminators Association)
LPI	Lightning Protection Institute
LSGA	Laminated Safety Glass Association (See GANA)
MBMA	Metal Building Manufacturers Association
MCA	Metal Construction Association
MFMA	Maple Flooring Manufacturers Association
MFMA	Metal Framing Manufacturers Association
MGPHO	Medical Gas Professional Healthcare Organization, Inc.
MHIA	Material Handling Industry of America
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association (See SSMA)

MSS	Manufacturers Standardization Society of The Valve and Fittings Industry Inc.
NAAMM	National Association of Architectural Metal Manufacturers
NAAMM	North American Association of Mirror Manufacturers (See GANA)
NACE	NACE International (National Association of Corrosion Engineers International)
NAIMA	North American Insulation Manufacturers Association (The)
NAMI	National Accreditation and Management Institute, Inc.
NAPM	National Association of Photographic Manufacturers (See PIMA)
NBGQA	National Building Granite Quarries Association, Inc.
NCMA	National Concrete Masonry Association
NCPI	National Clay Pipe Institute
NCTA	National Cable Television Association
NEBB	National Environmental Balancing Bureau
NECA	National Electrical Contractors Association
NeLMA	Northeastern Lumber Manufacturers' Association
NEMA	National Electrical Manufacturers Association
NETA	InterNational Electrical Testing Association
NFPA	National Fire Protection Association
NFRC	National Fenestration Rating Council
NGA	National Glass Association
NHLA	National Hardwood Lumber Association
NLGA	National Lumber Grades Authority
NOFMA	National Oak Flooring Manufacturers Association
NPA	National Particleboard Association (See CPA)
NRCA	National Roofing Contractors Association
NRMCA	National Ready Mixed Concrete Association

NSA	National Stone Association
NSF	NSF International (National Sanitation Foundation International)
NTMA	National Terrazzo and Mosaic Association, Inc.
NWWDA	National Wood Window and Door Association (See WDMA)
PCI	Precast/Prestressed Concrete Institute
PDCA	Painting and Decorating Contractors of America
PDI	Plumbing & Drainage Institute
PGI	PVC Geomembrane Institute
PIMA	Photographic & Imaging Manufacturers Association (Formerly: NAPM - National Association of Photographic Manufacturers)
RCSC	Research Council on Structural Connections
RFCI	Resilient Floor Covering Institute
RIS	Redwood Inspection Service
RMA	Rubber Manufacturers Association
SAE	SAE International
SDI	Steel Deck Institute
SDI	Steel Door Institute
SEFA	Scientific Equipment and Furniture Association
SGCC	Safety Glazing Certification Council
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
SPFA	Spray Polyurethane Foam Alliance (Formerly: SPI/SPFD - The Society of the Plastics Industry, Inc.; Spray Polyurethane Foam Division)

References

SPI	The Society of the Plastics Industry
SPIB	Southern Pine Inspection Bureau (The)
SPI/SPFD	The Society of the Plastics Industry Spray Polyurethane Foam Division (See SPFA)
SPRI	SPRI (Single Ply Roofing Institute)
SSINA	Specialty Steel Industry of North America
SSMA	Steel Stud Manufacturers Association (Formerly: ML/SFA - Metal Lath/Steel Framing Association)
SSPC	SSPC: The Society for Protective Coatings
STI	Steel Tank Institute
SWI	Steel Window Institute
SWRI	Sealant, Waterproofing, and Restoration Institute
TCA	Tile Council of America, Inc.
TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
TPI	Truss Plate Institute
TPI	Turfgrass Producers International
UFAC	Upholstered Furniture Action Council
UL	Underwriters Laboratories Inc.
UNI	Uni-Bell PVC Pipe Association
USITT	United States Institute for Theatre Technology, Inc.
USP	U.S. Pharmacopeia
WASTEC	Waste Equipment Technology Association
WCLIB	West Coast Lumber Inspection Bureau
WCMA	Window Covering Manufacturers Association (Formerly: AWCMA - American Window Covering Manufacturers Association)
WDMA	Window & Door Manufacturers Association (Formerly: NWWDA - National Wood Window and Door Association)
WIC	Woodwork Institute of California

WMMPA Wood Moulding & Millwork Producers Association

WWPA Western Wood Products Association

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

ICC International Code Council
(Formerly: CABO - Council of American Building Officials)

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

CE Army Corps of Engineers

CPSC Consumer Product Safety Commission

DOC Department of Commerce

EPA Environmental Protection Agency

FAA Federal Aviation Administration

FCC Federal Communications Commission

FDA Food and Drug Administration

GSA General Services Administration

HUD Department of Housing and Urban Development

LBL Lawrence Berkeley Laboratory (See LBNL)

LBNL Lawrence Berkeley National Laboratory

NCHRP National Cooperative Highway Research Program (See TRB)

NIST	National Institute of Standards and Technology
OSHA	Occupational Safety & Health Administration
RUS	Rural Utilities Service (See USDA)
TRB	Transportation Research Board
USDA	Department of Agriculture
USPS	Postal Service

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list:

CALTRANS	State of California, Department of Transportation
CAPUC	(See CPUC)
CBHF	State of California, Department of Consumer Affairs Bureau of Home Furnishings and Thermal Insulation
CPUC	California Public Utilities Commission
DGS	State of California, Department of General Services
DPR	State of California, Department of Parks and Recreation
TFS	Texas Forest Service Forest Products Laboratory

END OF SECTION 014200

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.2 USE CHARGES

A. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to State's Representative, testing agencies, and authorities having jurisdiction.

B. Water Service from Existing System: Water from State's existing water system is not available for use.

C. Electric Power Service from Existing System: Electric power from State's existing system is available for use . Provide connections and extensions of services as required for construction operations.

D. Dewatering Permits: Contractor shall be responsible for obtaining any dewatering permits, including payment of permit fees, necessary for trench and structure excavation dewatering required to complete construction.

E. Temporary Discharge Permits: Contractor shall be responsible for obtaining temporary discharge permits, including payment of permit fees, necessary for disposal of water generated during the Work, rinsing and flushing of piping and storage facilities, and as required to complete construction.

1.3 INFORMATIONAL SUBMITTALS

A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

B. Site Fire-Safety Plan: Contractor to provide prior to start of construction and must be verified by the OSFM Deputy. The plan must adhere to CFC Chapter 33 and Site Fire Safety Plan per CFC 3303.1.1.

C. Moisture- and Mold-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage and mold. Describe delivery, handling, storage, installation, and protection provisions for materials subject to water absorption or water damage.

1. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and requirements for replacing water-damaged Work.
2. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
3. Indicate methods to be used to avoid trapping water in finished work.

1.4 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

C. Accessible Temporary Egress: Comply with applicable provisions in the United States Access Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1.

1.5 PROJECT CONDITIONS

A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before State's acceptance, regardless of previously assigned responsibilities.

PART 2 – PRODUCTS

2.1 TEMPORARY FACILITIES

A. Field Offices: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Common-Use Field Office: Of sufficient size to accommodate needs of State, State’s Representative and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

2.2 EQUIPMENT

A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

B. HVAC Equipment: Unless State authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.

C. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 – EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as State's property.

3.2 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

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

3.3 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, State, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.

C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.

D. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

E. Temporary Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.

1. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.

F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas.

G. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.

H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.

I. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel.

J. Electronic Communication Service: Provide secure WiFi wireless connection to internet with provisions for access by State's Representative and State.

3.4 SUPPORT FACILITIES INSTALLATION

A. Comply with the following:

1. Provide construction for temporary field offices, shops, and sheds located within construction area or within 30 feet of building lines that is noncombustible according to ASTM E136. Comply with NFPA 241.

2. Utilize designated area within existing building for temporary field offices.
3. Maintain support facilities until State's Representative schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to State.

B. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

C. Parking: Use designated areas of State's existing parking areas for construction personnel.

D. Storage and Staging: Use designated areas of Project site for storage and staging needs.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.

F. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Section 017300 "Execution."

H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property State to access property for that purpose.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Temporary Erosion and Sedimentation Control: Comply with requirements specified in Section 311000 "Site Clearing."

D. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to

undisturbed areas and to adjacent properties and walkways, according to requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant-protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

E. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.

F. Tree and Plant Protection: Comply with requirements specified in Section 015639 "Temporary Tree and Plant Protection."

G. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

H. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.

I. Site Enclosure Fence: Before construction operations begin, furnish and install site enclosure fence in a manner that will prevent people from easily entering site except by entrance gates.

1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

2. Maintain security by limiting number of keys and restricting distribution to authorized personnel.Furnish one set of keys to State.

J. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.

K. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

L. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.

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

1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.

N. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.6 MOISTURE AND MOLD CONTROL

A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.

B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are

still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard and replace stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

3.7 OPERATION, TERMINATION, AND REMOVAL

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

B. Maintenance: Maintain facilities in good operating condition until removal.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.

C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

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

1. Materials and facilities that constitute temporary facilities are property of Contractor. State reserves right to take possession of Project identification signs.
2. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 017700 "Closeout Procedures."

END OF SECTION 015000

SECTION 015050

EROSION CONTROL

PART 1 - GENERAL

1.1 SCOPE OF WORK

A. The Contractor shall provide all materials, labor and equipment necessary to complete all work as specified herein, including but not limited to the following:

1. Apply specified treatments to all cuts and fill slopes, soil stockpiles, and all disturbed areas.
2. Install all temporary erosion control devices per Plans and Specifications.

B. All other labor and materials reasonably incidental to the satisfactory completion of the work, including cleanup of the site.

1.2 RELATED SECTIONS

A. Requirements of Division 01 apply to Work of this Section.

1.3 RELATED DOCUMENTS

A. Provide erosion control in accordance with project SWPPP requirements and applicable Caltrans Standards at time of Bid.

B. Association of Official Seed Analysts Procedures.

C. California State Seed Law of the Department of Food and Agriculture.

1.4 CONTRACTOR SUBMITTALS

A. The Contractor shall submit, in accordance with Section 01 10 00, Supplemental General Requirements, manufacturer’s letters of compliance and manufacturer’s literature for the following items:

1. Seed Mixes (or individual items)
2. Mulches
3. Binders/Tackifiers
4. Fertilizer
5. Humate
6. Soil inoculates
7. Straw (Weight receipts from scales shall be required)
8. Erosion Control Blanket

1.5 SITE CONDITION

A. It is the responsibility of the Contractor to visit the site to determine existing conditions including access to the site, the nature and extent of existing improvements upon adjacent public and private property, the nature of materials to be encountered, and other factors that may affect the work of this section.

B. It is the responsibility of the Contractor to have finished the grading of the slopes, including track walking the areas to be treated with erosion control treatments.

1.6 WORK SCHEDULE

A. The Contractor shall proceed with work during a period of August 15 through October 15 or between January 15 and February 15. The work shall progress as soon as the site becomes available consistent with normal seasonal limitations.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

A. All products shall be delivered to the site in manufacturer's unopened standard containers bearing original labels showing quantity, analysis and name of manufacturer.

B. All materials shall be stored in designated areas and in such a manner as to protect them from weather or other conditions that might damage or impair the effectiveness of the product.

1.8 ANALYSIS OF SAMPLES AND TESTS

A. Samples: The State reserves the right to take and analyze samples of materials for conformity to the Specifications at any time. On request, seed shall delivered to State's Representative 30 days prior to seeding so seed can be tested. Seed samples shall be drawn in accordance with procedures outlined in Association of Official Seed Analysts.

B. Rejected material: Rejected materials shall be removed immediately from the site at Contractor's expense. Contractor shall pay the cost of testing replacement materials.

PART 2 - PRODUCTS

2.1 GENERAL

A. All products shall be in conformance with the Specifications listed below. Any changes to products to be used shall be approved, in writing, by the State or State's Representative prior to job site delivery.

2.2 SEED MIX

A. Seed shall conform to the provisions in Section 21-2.02F, "Seed," of the Standard Specifications. Individual seed species shall be measured and mixed in the presence of the State's Representative.

B. Seed shall be delivered to the project site in unopened separate containers with the seed tag attached. Containers without a seed tag attached will not be accepted.

C. Composition: Provide seed mix as approved by State's Representative.

D. Quality

1. All seed shall be in conformance with the California State Seed Law of the Department of Food and Agriculture. Each seed bag shall be delivered to the site sealed and clearly marked as to species, purity, percent germination, dealer's guarantee, and dates of test. In addition, the container shall be labeled to clearly reflect the amount of Pure Live Seed (PLS) contained.
2. Submit seed certification and PLS calculations when requested by State's Representative.
3. All legume seed, when included in approved seed mix, shall be pellet-inoculated. Inoculant sources shall be species specific and shall be applied at a rate of 2 pounds of inoculant per one hundred pounds of seed.

2.3 MULCH

A. Mulch shall be 100% wood hydroseed and shall be composed of wood fiber derived from whole wood chips with no growth or germination inhibiting substances, and shall be manufactured in such a manner that when thoroughly mixed with seed, fertilizer, organic stabilizer, and water, in the proportions specified, will form a homogeneous slurry which is capable of being sprayed to form a porous mat.

B. The fibrous mulch in its air-dry state shall contain no more than 15% by weight of water. The fiber shall have a temporary green dye and shall be accompanied by a certificate of compliance stating that the fiber conforms to these Specifications.

2.4 ORGANIC STABILIZER/TACKIFIER

A. Stabilizer and tackifier shall be an organic substance supplied in powder form and shall be psyllium-based and packed in clearly marked bags stating the contents of each package. The California Department of Food and Agriculture shall certify the material as an Auxiliary Soil Chemical.

2.5 FERTILIZER

A. Fertilizer shall be of commercial quality, conform to the requirements of the California Department of Food and Agriculture Code, shall have a guaranteed analysis for nitrogen, phosphorus and potassium of 7-2-3. Products specified as slow-release shall have been tested and demonstrate a nearly linear release curve.

2.6 HUMATE

A. Humate shall be OMRI listed and contain at least 40 % Humic acid. It shall be a natural granual humic acid based material that functions as an organic chelator and microbial stimulator. Humate shall not burn plant material and shall be non-toxic and non-staining.

B. Humate Soil Conditioner

Humic Acids (from Leonardite)	40 .00 %
Organic matter	40 .00 % - 50.00%
Carbon	50.00 % - 60.00%
Nitrogen	0.05 % - 1%
Phosphoric Acid	0.07 %
Potash	0.13 %
Sulfur	0.21 %
Magnesium	0.18 %
Calcium	0.32 %
pH	4.0
Soluble Salts	1.8

2.7 MYCORRHIZAL INOCULUM

A. Endo (arbuscular) mycorrhizal inoculum shall be registered by the California Department of Food and Agriculture and consist of spores, mycelium and mycorrhizal root fragments in a solid carrier suitable for handling by hydro-seeding. The carrier shall be the material in which the inoculum was originally produced, and may include organic materials, vermiculite, perlite, calcined clay, or other approved materials consistent with mechanical application and with good plant growth.

B. Each endomycorrhizal inoculum shall carry a supplier's guarantee of 80,000 propagules minimum per kilogram. The minimum propagule count shall be shown on each label provided. If more than one fungal species is claimed by the supplier, the label shall include a guarantee for each species of mycorrhizal fungus claimed.

C. Endomycorrhizal fungal species shall be suitable for the pH of the soil at the planting site. If the inoculum consists of a mixture of species, no more than

20% of the claimed propagule count shall consist of fungal species known to be unsuitable for the pH of the soil at the planting site.

D. Endomycorrhizal inoculum shall be stored, transported and applied at temperatures of less than 32° C (90° F).

2.8 STRAW

A. Shall be derived from irrigated rice or clean cereal grain straw.

B. The Contractor shall furnish evidence that clearance has been obtained from the County Agricultural Commissioner, as required by law, before straw from outside the County in which it is to be used is delivered to the site of the work.

C. Straw that has been used for bedding is prohibited.

2.9 EQUIPMENT

A. Equipment used for application of slurry shall be a commercial-type Hydro-Seeder and have a built-in agitation system with an operation capacity sufficient to agitate, suspend and homogeneously mix slurry.

B. Tank capacity shall be a minimum of 1,500 gallons and shall be mounted on a truck to allow access to the site.

C. Pump shall be able to generate 150 psi at the nozzle.

D. Straw blowers: Equipment shall be specifically designed and manufactured for the application of straw and shall be of sufficient horsepower to break up and distribute straw at the specified application rate.

2.10 WATER

A. Water shall be of potable quality.

2.11 EROSION CONTROL BLANKETS

A. Erosion control must be Erosion Control Technology Council (ECTC) Type 2D and made of processed natural fibers that are mechanically, structurally, or chemically bound together to form a continuous matrix that is surrounded by 2 natural nets. Erosion control blanket must comply with the requirements shown in the following table:

Erosion Control Blanket

Quality characteristic	Test method	Requirement		
		Type A	Type B	Type C
Roll width (min, inches)	--	72		

Matrix (%) Straw/coconut Woven coir (coconut fiber) Wood excelsior (6 inches or longer)	--	70/30 -- --	-- 100 --	-- -- 80
USLE C-Factor for a 1:1 (H:V) unvegetated slope	--	≤ 0.20		
Shear stress (max, psf)	ASTM D6460	1.75		
Tensile strength (min, psf)	ASTM D5035	75		
Functional longevity (months)	--	12		

PART 3 - EXECUTION

3.1 SOIL PREPARATION

A. No soil amendments shall be required except as noted on the Plans.

B. Verification: Contractor shall verify:

1. That all areas to receive erosion control treatments are free of vegetation and other objectionable material.
2. That grades are final for permanently treated areas and within reasonable standard for temporary treatments.
3. That all sloped areas are uniformly compacted: wherever possible, the surface compaction of the top 1 foot shall be 85% or less.

3.2 EROSION CONTROL BLANKET INSTALLATION

A. Before placing the erosion control blankets, Contractor shall ensure the subgrade has been graded smooth and has no depressed voids. The subgrade must be free from obstructions, such as tree roots, projecting stones, or foreign matter greater than 1 inch in diameter. Overlap the end of the erosion control blanket by 24 inches. Use 18 inch staples staked at maximum of 4 feet on center in staggered pattern. Do not drive vehicles on the erosion control blanket.

3.3 HYDROSEEDED AREA

A. Areas to receive erosion control treatments include all graded areas as shown on the site plan and other areas as determined by State's Representative.

B. Perform erosion control treatments on a section by section basis. On approval by State's Representative, and as soon as possible after grading,

complete treatments in the following order of priority: stream zones, graded slopes, non-trafficked road and parking areas, building pads and other flat areas.

C. Contractor shall be available to re-treat areas disturbed by on-going activities.

D. Preparation: All slurry preparation to be conducted at the job site.

1. Water, mulch, fertilizer, compost, binder and other ingredients shall be added to the tank simultaneously so that the finished load is a homogenous mix of the specified ingredients.
2. Seed shall be added last and shall be discharged within 2 hours. Loads held over 2 hours will be recharged with ½ the seed rate before application.
3. Once fully loaded, the complete slurry shall be agitated for 3-5 minutes to allow for uniform mixing.

E. Application: Apply specified slurry in a sweeping motion to form a uniform application.

1. Step One - with hydroseeder apply:

a.	Seed Mix Total	4 lbs./acre
b.	100% Cellulose Fiber Mulch	500 lbs./acre
c.	Biosol 7-2-3 (Organic Fertilizer)	1,600 lbs./acre
d.	AM120 (Mycorrhizal Inoculant)	60 lbs./acre

2. Step Two - with straw blower apply:

a.	Rice or Clean Cereal Grain Straw	4,000 lbs./acre

3. Step Three - with hydroseeder apply:

a.	100% Cellulose Fiber Mulch	500 lbs./acre
b.	M-Binder	100 lbs./acre

4. Under suitable conditions straw shall be uniformly spread at the specified rates. The straw may be pneumatically applied as long as the resulting straw is predominately 3 to 6 inches in length. The straw shall be treated with mulch and tackifier before it can blow off the site but in no case shall straw be left untreated for more than 24 hours. The Contractor will clean up areas of straw which are blown from the site, and the areas shall be retreated at no additional expense to the State.

F. Protection: Contractor is to stay off treated areas.

G. Unused Loads: If mixture remains in tank for more than 8 hours it shall be removed from the job site at Contractor’s expense.

H. Preliminary Inspection: Notify the State's Representative 48 hours in advance of all seeding. Inspection and favorable review of completed work shall begin the plant establishment period.

3.4 PLANT ESTABLISHMENT MAINTENANCE

A. General plant maintenance shall immediately follow seeding and continue for 90 days.

B. Protect areas against all damage, including erosion and trespass, and provide proper safeguards. Maintain and keep in good repair all temporary barriers erected to prevent trespassing. Check all barrier and temporary fencing daily, and make immediate repairs or replacements

C. Repair all damage to seeded areas.

D. Maintain constant moisture depth in soil to insure vigorous growth.

3.5 FINAL INSPECTION AND ACCEPTANCE:

A. Final inspection will be conducted upon completion of maintenance, replacements and corrective work. Five (5) days' notice shall be given. If project improvements, corrective work, and maintenance have not been performed as specified and to the satisfaction of the State's Representative, maintenance shall continue at Contractor's expense until such time as work has been successfully completed.

3.6 GUARANTEE AND REPLACEMENT

A. Guarantee all planting to be in a healthy, thriving condition until the end of the maintenance period or beyond that time until active growth is evident and for one year from date of acceptance.

B. Replace all seeded areas not in vigorous condition as soon as directed by State's Representative. Seed mixture used for replacement must be of the same kind and quantity as specified in this section.

3.7 CLEAN-UP

A. Erosion control work areas shall be maintained in a neat and orderly condition. Keep paved area free of erosion treatment, soil, and other debris.

B. Overspray: Installing Contractor is responsible for washing or otherwise cleaning excess material off all areas not intended to receive treatment.

C. Debris: Clean up and remove erosion control associated materials and debris from project site before Final Acceptance.

END OF SECTION 015050

SECTION 015639

TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

A. The Work of this Section Includes: General protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

1.2 PROTECTED ELDERBERRY PLANTS

A. Elderberry (Sambucus spp,) identified on the Drawings shall be considered protected plant material. Protection requirements of this Section applicable to protected trees shall also apply to protected Elderberry plants unless otherwise directed by State's Representative.

B. Field verify locations and extents of Elderberry plants prior to the start of construction. Conduct required protection review meeting with State's Representative prior to commencing work within or adjacent to Elderberry protection areas.

1.3 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape at a height 6 inches above the ground for trees up to and including 4-inch size at this height and as measured at a height of 12 inches above the ground for trees larger than 4-inch size.

B. Diameter at breast height (DBH): diameter of a trunk as measured by a diameter tape at a height 4.5 feet from the ground surface.

C. Canopy Radius: Approximate average distance from the stem to the limits of the drip line, or end of branches.

D. Critical Root Zone (CRZ): The minimum volume of roots necessary for the maintenance of tree health and stability, typically determined by measuring the tree diameter 4.5 ft. above grade and multiplying by 12 in., a minimum radius of 10' from the trunk, or at the tree's dripline, whichever is farthest from the trunk, or as otherwise indicated on the drawings, or established in the field. CRZ will be determined/established on a case by case basis by the arborist and approval by the landscape architect.

E. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction and indicated on Drawings.

F. Stems: Number of trunks or shoots that contribute significantly to the canopy.

G. Tree-Protection Zone: The area to be protected by temporary fencing during construction. A distance of 5 times the DBH from the tree trunk, or at the tree drip line, whichever is greater.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site with representatives for the architect, arborist, contractor, and client present.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to the following:
    a. Tree-service firm's personnel and equipment needed to make progress and avoid delays.
    b. Arborist's responsibilities.
    c. Quality-control program.
    d. Coordination of Work and equipment movement with the locations of protection zones.
    e. Trenching by hand or with air spade within protection zones.
    f. Field quality control.

1.5 ACTION SUBMITTALS

A. Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1. Species and size of tree or protected plan.
2. Location on site plan. Include unique identifier for each.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance following pruning.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For tree service firm.

B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction in accordance with recognized

standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or video recordings.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

E. Quality-control program.

1.7 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by the International Society of Arboriculture ISA.

B. Quality-Control Program: Prepare a written program to systematically demonstrate the ability of personnel to properly follow procedures and handle materials and equipment during the Work without damaging trees and plantings. Include dimensioned diagrams for placement of protection-zone fencing and signage, the arborist's and tree-service firm's responsibilities, instructions given to workers on the use and care of protection zones, and enforcement of requirements for protection zones.

1.8 FIELD CONDITIONS

A. No development, fill, excavation, construction materials, equipment staging, or traffic shall be allowed in the critical root zone of the trees that are to be retained. Practices prohibited within the protection zones include:

1. Storage of construction materials, debris, or excavated material.
2. Moving or parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. If any construction work needs to be performed inside either the tree drip line, critical root zone, and/or the inner critical root zone, the project arborist will be on site to supervise the work.

C. Do not direct vehicle or equipment exhaust toward protection zones.

D. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill Soil: Planting soil of suitable moisture content and granular texture for placing around tree; free of stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.

B. Protection-Zone Fencing: Subject to approval by the Director, fencing fixed in position and meeting the following requirements:

1. Protection-Zone Fencing: High density polyethylene fencing with 3.5” x 1.5” openings.
   a. Height: 6 feet.
   b. Color: Orange
   c. Manufactured by White Cap or approved equal.
   d. Posts: 2” diameter steel post may be steel driven or set in temporary anchor block.

2. Gates: Double- swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones; leaf width 36 inches.

C. Protection-Zone Signage: Signs shall be posted visibly on all sides of the fenced areas.

1. Shop-fabricated, rigid plastic or metal sheet with attachment holes pre-punched and reinforced; legibly printed with nonfading lettering and as follows:
   a. Sign placard: Twelve inches tall by 18 inches long, laminated in plastic.
   b. Text: "Tree Protection Area"
   c. Lettering: 4-inch- high minimum, black characters on white background.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

B. Prepare written report, endorsed by arborist, listing conditions detrimental to tree and plant protection.

3.2 PREPARATION

A. With Landscape Architect, locate and clearly identify trees, shrubs, and other vegetation to remain. Tie a 1-inch blue vinyl tape around each tree trunk at 54 inches above the ground.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

1. In addition to the above minimum tree protection measures, support tree protection efforts by employing, as appropriate, the following best management practices for maintaining the health of the tree:
    a. Prune visible deadwood on trees to be protected or relocated.
    b. Provide a layer of wood chip mulch 4-5 inches deep in the CRZ of retained trees.
    c. Ensure one inch of irrigation or rainfall per week during and immediately after construction and from early May through September until reliable rainfall occurs in the fall.

3.3 TREE PROTECTION

A. Prior to any land disturbance, place temporary construction fence around the tree protection zone to be preserved. If a cluster of trees is proposed for retention, the barrier shall be placed around the edge formed by the CRZ of the trees to be retained. If work is to occur within CRZs, fencing on Tree Retention Plan will indicate acceptable location and additional alternative protection methods employed (trunk wrap, CRZ matting, etc).

B. Contractor shall protect all trees within the designated construction area from damage by fencing the TPZ of individual, or groups of, trees with construction fencing.

C. Tree protection shall remain in place for the duration of the permit unless earlier removal is addressed through construction sequencing on approved plans.

D. If any construction work must be performed inside either the tree drip line, critical root zone, and/or the inner critical root zone, the project arborist shall be on site to supervise the work.

1. Install temporary root-protection matting over mulch to the extent indicated by the Tree Retention Plan.
2. Hand clear t prevent root damage, in a manner approved by the State's representative.
3. Tunnel below the roots.
4. Directional drill beneath the roots.

3.4 PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected areas except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

1. Protection Zone Fencing: Install to comply with manufacturer's written instructions.
2. Posts: Set posts using pier blocks only. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
   a. Avoid driving posts of stakes into major roots.
3. Access Gates: Install as required; adjust 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.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced approximately every 50 ft. on protection-zone fencing, but no fewer than four signs with each facing a different direction. 4-inch minimum text size, sign laminated in plastic.

C. Maintain protection zones free of weeds and trash.

D. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.5 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones in accordance with requirements in Section 312000 "Earth Moving" unless otherwise indicated.

B. Trenching or Excavating within Protection Zones: Where utility trenches are required within protection zones, excavate under or around tree roots by hand or with air spade, or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots.

C. 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 and as required for root pruning.

D. 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.

3.6 ROOT PRUNING

A. Pruning of any limbs or roots 2” or larger shall be supervised and approved by the State’s Representative and as directed by a certified arborist.

B. Prune tree roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots. Any root pruning must be supervised by an arborist.
2. Cut Ends: Do not paint cut root ends.
3. Temporarily support and protect roots from damage until they are permanently covered with soil.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible in accordance with requirements in Section 312000 "Earth Moving."

C. Root Pruning at Edge of Protection Zone: Prune tree roots 12 inches outside of the protection zone by cleanly cutting all roots to the depth of the required excavation.

D. Root Pruning within Protection Zone: Clear and excavate by hand or with air spade to the depth of the required excavation to minimize damage to tree root systems. If excavating by hand, use narrow-tine spading forks to comb soil to expose roots. Cleanly cut roots as close to excavation as possible.

3.7 CROWN PRUNING

A. Pruning of any limbs or roots 2” or larger shall be supervised and approved by the State’s Representative and as directed by a certified arborist.

B. Prune branches that are affected by temporary and permanent construction. Raise Prune branches as directed by arborist.

1. Prune to remove only injured, broken, dying, or dead branches unless otherwise indicated. Do not prune for shape unless otherwise indicated.
2. Do not remove or reduce living branches to compensate for root loss caused by damaging or cutting root system.
3. Pruning cuts should be made back to an appropriate branch or trunk. Do not stub cut branches or top a tree.
4. Do not remove more than 25% of the overall canopy.
5. Pruning Standards: Prune trees in accordance with ANSI A300 (Part 1).

C. Unless otherwise directed by arborist and acceptable to Architect, do not cut tree leaders.

D. Cut branches with sharp pruning instruments; do not break or chop.

E. Do not paint or apply sealants to wounds.

F. Provide subsequent maintenance pruning during Contract period as recommended by arborist.

G. Chip removed branches and stockpile in areas approved by Architect.

3.8 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, construct rock walls around the tree, equal to the dripline. Maintain existing grades within the protection zone.

B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

1. If additional grade is required within the CRZ, increase grade by a maximum of 3".

3.9 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.10 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or to be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed pruning and repairs.
2. Perform repairs of damaged trunks, branches, and roots within 24 hours in accordance with arborist's written instructions.
3. Replace trees and other plants that cannot be repaired and restored to full-growth status, as determined by owner’s representative.
4. Provide new plants of same size.

B. IF any tree, not designated for removal, is damaged or destroyed during the course of, as a result of, construction operations, the Contractor shall repair the damage, if possible, under the guidance of a certified arborist as no additional cost to the State. In addition, the Contractor shall pay the State an amount calculated in accordance with the formulas below. Damage is defined, without limitation, as any cutting, breaking, tearing, bruising or skinning of the trunk, roots or significant limbs.

1. The total tree value shall be paid to the State for a tree totally destroyed:
   a. Total Tree Value = $2.16 x (Trunk circumference in inches at DBH) x squared.
   b. Example: 24-inch Diameter Pine Circumference = 75.4 inches
      1) $2.16 x (75.4) squared = $12,280
      2) Total Tree Value $12,280

C. A proportional amount of total tree value shall be paid to the State, for each tree damaged, based upon the amount of damage to the trunk and roots. Total truck and root damage shall not exceed a factor of 1.0

1. Damage = Total Tree Value x (Trunk Damage Factor + Root Damage Factor)
2. Trunk Damange = Maximum width of trunk damage divided by trunk circumference.
3. Root Damage = Percentage of root damage based on size of root damaged. Percentages will be added for multiple roots damaged within the root zone of one tree. Assumed root zone for all trees is a 20-foot diameter or 314 square feet. The following table determines percentage of overall root damage based on size of root damaged.

Root size (inches)	Equivalent Percent of Root Zone	Damage Factor
2 to 3	10	0.1
4 to 5	20	0.2
6 and larger	30	0.3

D. Example: 24 inch diameter Pine with 6-inch wide trunk damage and with one 2-inch root and one 4-inch root damaged.

1. Trunk damage: 6/75.4 = 0.08
2. Root damage: 0.1+0.2 = 0.3
3. Damage $ = $12,280 x (0.08 + 0.3)
4. Total Damage $4,666

E. Total amount of such damages shall be deducted from any funds due, or that become due to the Contractor. All destroyed trees shall remain the

property of the State. At no additional cost to the State, the Contractor shall remove destroyed trees from State Park property if directed by the State's Representative.

F. Decompaction: Decompact soils by hand as needed.

END OF SECTION 015639

SECTION 016000

PRODUCT REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Requirements:

1. Section 012500 "Substitution Procedures" for requests for substitutions.

1.2 DEFINITIONS

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

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes

of evaluating comparable products of additional manufacturers named in the specification.

C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.

D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:

1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.

E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Section 013300 "Submittal Procedures."

F. Substitution: Refer to Section 012500 "Substitution Procedures" for definition and limitations on substitutions.

1.3 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

1.5 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the State or endorsed by manufacturer to State.

2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for State and issued in the name of the State or endorsed by manufacturer to State.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

PART 2 – PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

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

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. State reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," State's Representative will make selection.
5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

B. Product Selection Procedures:

1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

    a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."

2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."

3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.

   a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
   b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.

5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.

   a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
   b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.

7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

   a. For approval of products by unnamed manufacturers, comply with requirements in Section 012500 "Substitution Procedures" for substitutions for convenience.

C. Visual Matching Specification: Where Specifications require the phrase "match State's sample," provide a product that complies with requirements and matches State's sample. State's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 012500 "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by State's Representative from manufacturer's full range" or a similar phrase, select a product that complies with requirements. State's Representative will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

E. Sustainable Product Selection: Where Specifications require product to meet sustainable product characteristics, select products complying with indicated requirements. Comply with requirements in Division 01 sustainability requirements Section and individual Specification Sections.

1. Select products for which sustainable design documentation submittals are available from manufacturer.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration of Comparable Products: State's Representative will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, State's Representative may return requests without action, except to record noncompliance with the following requirements:

1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects, with project names and addresses and names and addresses of State's Representatives and States, if requested.
5. Samples, if requested.

B. State's Action on Comparable Products Submittal: If necessary, State's Representative will request additional information or documentation for evaluation, as specified in Section 013300 "Submittal Procedures."

1. Form of Approval of Submittal: As specified in Section 013300 "Submittal Procedures."
2. Use product specified if State's Representative does not issue a decision on use of a comparable product request within time allocated.

C. Submittal Requirements, Two-Step Process: Approval by the State's Representative of Contractor's request for use of comparable product is not intended to satisfy other submittal requirements. Comply with specified submittal requirements.

D. Submittal Requirements, Single-Step Process: When acceptable to State's Representative, incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the State's Representative of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

PART 3 – EXECUTION (Not Used)

END OF SECTION 016000

SECTION 017300

EXECUTION

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of State's portion of the Work.
6. Coordination of State-installed products.
7. Progress cleaning.
8. Starting and adjusting.
9. Protection of installed construction.
10. Correction of Work

B. Related Requirements:

1. Section 011000 "Summary"

2. Section 017700 "Closeout Procedures"
3. Section 024119 "Selective Demolition" for demolition and removal of selected portions of the building.

1.2 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.3 INFORMATIONAL SUBMITTALS

A. Certified Surveys: Submit [**two**] <**Insert number**> copies signed by [**land surveyor**] [**professional engineer**].

B. Certificates: Submit certificate signed by [**land surveyor**] [**professional engineer**], certifying that location and elevation of improvements comply with requirements.

1.4 CLOSEOUT SUBMITTALS

A. Final Property Survey: Submit [**10**] <**Insert number**> copies showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Comply with requirements specified in other Sections.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to State’s Representative for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.

C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 – EXECUTION

3.1 EXAMINATION

A. General: DPR does not belong to Underground Service Alert (USA). USA can be used for locating municipal and public utilities but locating existing utilities owned by DPR is the Contractor’s responsibility.

B. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems**,** and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

C. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

D. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

1. Description of the Work, including Specification Section number and paragraph, and Drawing sheet number and detail, where applicable.
2. List of detrimental conditions, including substrates.
3. List of unacceptable installation tolerances.
4. Recommended corrections.

E. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to State that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for

information to State's Representative in accordance with requirements in Section 013100 "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. General: Control points and benchmarks shown on the Plans and used by the Engineer may be damaged or destroyed before the construction Contract is awarded. It is the Contractor's responsibility to establish benchmarks and control points as needed to construct the improvements and elsewhere as needed to locate each element of the Project.

B. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, promptly notify State's Representative for resolution prior to commencing Work in the affected areas.

C. Engage a [**land surveyor**] [**professional engineer**] experienced in laying out the Work, using the following accepted surveying practices:

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish limits on use of Project site.
3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
4. Inform installers of lines and levels to which they must comply.
5. Check the location, level and plumb, of every major element as the Work progresses.
6. Notify State's Representative[**and State's Representative**] when deviations from required lines and levels exceed allowable tolerances.
7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

D. Use of CAD Files: Use of CAD files for surveying in improvements is done at risk. No warranty or guarantee is expressed or implied as to the accuracy or completeness of the files. Not all surface features encountered at the start of construction may be shown in the files or present when the files were created. Additional survey required to update, add, correct, etc., for site features that are new, have moved, or have been removed since the survey was preformed or is otherwise in any way required to layout the Work is the Contractor's responsibility. Notify the State's Representative of any discrepancies or conflicts discovered while laying out the Work and wait for written resolution before commencing work in the affected area.

E. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations. Promptly notify the State's Representative if existing infrastructure, surface features, etc. are encountered that conflict with the planned improvements. Wait for written resolution before commencing work in the affected area.

F. Buried Pipe, Conduits, and Utilities: Locate and lay out buried improvements. Verify the location, depth, and alignment of existing utilities that cross the improvements and any surface features, vegetation, etc. that conflict with the placement or alignment. Report conflicts and discrepancies to the State's Representation for resolution prior to commencing work in the affected areas.

G. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

H. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by State's Representative.

3.4 FIELD ENGINEERING

A. Identification: State will identify existing benchmarks, control points, and property corners.

B. General: Control points and benchmarks shown on the Plans and used by the Engineer may be damaged or destroyed before the construction Contract is awarded. It is the Contractor's responsibility to establish benchmarks and control points as needed to construct the improvements and elsewhere as needed to locate each element of the Project.

C. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of State's Representative. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to State's Representative before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

D. Benchmarks: Establish and maintain a minimum of [**two**] <**Insert number**> permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.

3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

E. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

F. Final Property Survey: Engage a [**land surveyor**] [**professional engineer**] to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by [**land surveyor**] [**professional engineer**], that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.

1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

3.5 INSTALLATION

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb, and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure satisfactory results as judged by State’s Representative. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.

G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of

other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by State's Representative.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by State's Representative. Fit exposed connections together to form hairline joints.

J. Repair or remove and replace damaged, defective, or nonconforming Work.

1. Comply with Section 017700 "Closeout Procedures" for repairing or removing and replacing defective Work.

3.6 CUTTING AND PATCHING

A. General:

1. Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
2. Cut in-place construction to provide for installation of other components or performance of other construction and subsequently patch as required to restore surfaces to their original condition.

B. Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify State's Representative of locations and details of cutting and await directions from State's Representative before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.

2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.
3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.
4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in State's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

D. Temporary Support: Provide temporary support of Work to be cut.

E. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

F. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching in accordance with requirements in Section 011000 "Summary."

G. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

H. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.

5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.

6. Proceed with patching after construction operations requiring cutting are complete.

I. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by State's Representative. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

J. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 COORDINATION OF STATE'S PORTION OF THE WORK

A. Site Access: Provide access to Project site for State's construction personnel.

1. Provide temporary facilities required for State-furnished, Contractor-installed products.
2. Refer to Section 011000 "Summary" for other requirements for Owner-furnished, Contractor-installed products

B. Coordination: Coordinate construction and operations of the Work with work performed by State's construction personnel.

1. Construction Schedule: Inform State of Contractor's preferred construction schedule for State's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify State if changes to schedule are required due to differences in actual construction progress.

3.8 PROGRESS CLEANING

A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.**[See Section 015719 – Temporary Environmental Controls for additional information.]**
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

a. Use containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials

are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 015000 "Temporary Facilities and Controls".**[and Section 017419 "Construction Waste Management and Disposal"]**.

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.10 PROTECTION AND REPAIR OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

D. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF WORK

A. Repair or remove and replace defective construction.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, properly adjusting operating equipment, and fixing leaks.
2. Repair Work previously completed and subsequently damaged during construction period.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

END OF SECTION 017300

SECTION 017419

CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section specifies diversion of construction debris from the landfill.

1. Waste Management Goals: a minimum of 75% of the total project waste should be diverted from landfill by, in order of preference 1) weight, 2) volume, whichever is most feasible to measure.
2. Provide a construction waste management plan, a construction waste estimate and a final waste management report to show evidence of recycling, and reuse of recovered materials.
3. Inform the Contracting Officer where Construction Waste Management requirements could detrimentally impact construction schedule.

B. Waste Management Objective for the Project:

1. The Government has established that this Project shall minimize the generation of construction and demolition waste at the site. Factors that contribute to waste, such as over-packaging, improper storage, ordering error, poor planning, breakage, mishandling, and contamination shall be minimized.
2. Of the inevitable waste that is generated, as many of the waste materials as economically feasible shall be reused or recycled. Waste disposal in landfills shall be minimized.

C. Diversion From Landfill: Waste categories appropriate for diversion from landfill shall include, but not be limited to, the following:

1. Land clearing debris
2. Soil
3. Wood: Clean dimensional wood, palette wood
4. Sheet Wood: Plywood, OSB and particle board
5. Concrete
6. Asphalt Concrete
7. Paper

    a. Bond
    b. Newsprint
    c. Cardboard and paper packaging materials

8. Metals

    a. Ferrous
    b. Non-Ferrous

9. Glass
10. Plastics
11. Beverage Containers

1.2 RELATED REQUIREMENTS

A. Appendix 017419A: Construction Waste Estimate.

B. Appendix 017419B: Waste Management Report.

C. Section 013300: Submittal Procedures.

D. Section 017700: Closeout Procedures.

1.3 REFERENCES

A. The California Integrated Waste Management Board (CIWMB); including the California Materials Exchange (CalMAX), Telephone 877-520-9703; www.ciwmb.ca.gov/calmax/. This provides a source of information, statewide, to buy and sell recycled materials.

B. Local Integrated Waste Management Programs and Re-Use Programs in the Project area.

C. The Department of Toxic Substances Control (DTSC).

1.4 CONSTRUCTION WASTE SUMMARY REPORTS

Provide delivery receipts for the recovered materials and waste materials sent to the permitted recycling facilities, processing facilities, or landfill with the following information:

1. Name of firm accepting the recovered materials or waste materials
2. Specify type of facility (e.g. recycler, processor, Class III landfill, MRF)
3. Location of the facility
4. Type of materials
5. Net weights (or volume) of each type of material
6. Date of Delivery
7. Value of the materials or tipping fee paid

1.5 APPLICATION FOR PROGRESS PAYMENT

The following should be submitted with the Application for Progress Payment:

1. Construction Waste Summary Reports as stated above in section 1.4 CONSTRUCTION WASTE SUMMARY REPORTS.
2. Payment could be withheld until diversion goals are met. The contractor is ultimately responsible for implementation of the Construction Waste Management Plan and achieving the diversion goals.

1.6 DEFINITIONS

A. Class III Landfill – A landfill that accepts non-hazardous waste such as household, commercial, and industrial waste, including construction, remodeling, repair, and demolition operations.

B. Construction and Demolition Waste – Including solid wastes, such as building materials, packaging, rubbish, debris, and rubble resulting from construction, remodeling, repair, and demolition operations.

1. Rubbish: Including both combustible and noncombustible wastes, such as paper, boxes, glass, crockery, metal and lumber scrap, tin cans, and bones.
2. Debris: Including both combustible and noncombustible wastes, such as leaves and tree trimmings that result from construction or maintenance and repair work.

C. Divert – Using material for any purpose other than disposal in a landfill or transformation facility.

D. Waste Materials – Large and small pieces of listed materials which are excess to contract requirements and generally include materials to be recycled an/or recovered from existing construction and items of trimmings, cuttings, and damaged goods resulting from new installations, which can be effectively used in the Work.

E. Reuse – Using a material or product that is recovered from construction, renovation, or demolition activities.

F. Recycling – The process of collecting and preparing recycle materials and reusing them in their original form or manufacturing processes that do not cause the destruction of recyclable materials in a manner that precludes further use.

G. Recovery – Any process that reclaims materials, substances, energy, or other products contained within or derived from waste on-site.

H. Sources Separation – Sorting recovered materials into specific material types with no or a minimum amount of contamination on site.

I. Commingled or Off-site Separation – Collecting all material types into a single bin or mixed collection system and separating the waste materials into recyclable material types in an off-site facility.

1.7 SUBMITTALS

A. Construction Waste Management Plan, Construction Waste Estimate
Before the start of construction, submit a construction waste management plan and a construction waste estimate for approval, including the following:

1. Indicate how the Contractor proposes to recover at least 75% of the construction wastes and debris for reuse and recycling.
2. The Construction Waste Management Plan should coordinate the recovery effort with the construction schedule.
3. Include a list of reuse facilities, recycling facilities and processing facilities that will be receiving the recovered recyclable materials.
4. Identify materials that are not recyclable or not recovered which will be disposed of in a landfill (or other means acceptable by the State of California and local ordinance and regulations) and explain why the materials are not recovered.
5. List the permitted landfill, or other permitted disposal facilities, that will be accepting the disposed waste materials.
6. Indicate instances or situations where compliance with the requirements of this specification do not apply or do not appear to be possible.
7. Prepare the Construction Waste Estimate identifying each type of waste material to be reused or recycled.

1.8 WASTE MANAGEMENT REPORT

A. Upon completion of Work including final cleanup, provide a final Waste Management Report containing the information required on Appendix 017419B, Waste Management Report forms.

1. The total quantity of each waste material generated; and the date(s) removed from the job-site.
2. The percent of the total quantity generated of each material sent to landfill, the identity of the landfill (receiving facility) handling costs, transport costs, tipping fees paid at the landfill, and total landfill

costs. Attach copies of manifests, weight tickets, receipts, and invoices.

3. For each material reused or recycled from the Project, include the percent of the total quantity generated, the identity of the receiving facility, the total costs of handling and transportation, and income. Attach manifests, weight tickets, receipts, and/or invoices.
4. Contractor shall edit and use forms included in Appendix 017419B, Waste Management Report, or use them as a basis for Contractor's forms.
5. The Government will provide electronic copies of Appendix 017419B for Contractors' use.

B. Submit Waste Management Report under provisions of Section 017700 – Closeout Procedures.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 WASTE MANAGEMENT

A. Manager: Contractor shall designate an on-site party (or parties) responsible for instructing workers and subcontractors, and overseeing and documenting results of Waste Management for the Project.

B. Distribution: Contractor shall distribute copies of the Construction Waste Estimate and Waste Management Report forms to the Job Site Foreman, each Subcontractor, and the Contracting Officer.

C. Meetings: Contractor shall conduct Waste Management meetings with subcontractors who generate construction waste. Contractor shall present current status of the Waste Management Report at regular job-site meetings.

D. Material Handling Procedures: Provide means by which waste materials will be protected from contamination, and means to be employed in reuse or recycling of waste material consistent with requirements for acceptance by receiving facilities.

1. Separation Facilities: Contractor shall lay out and label a specific area to facilitate separation of materials for reuse and recycling. Recycling and waste bin areas shall be kept neat and clean and clearly marked in order to avoid contamination of materials.

2. Hazardous Wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations, and in accordance with specifications for such work as may be included in the Project.
3. Instruction: Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at appropriate stages of the Project.

END OF SECTION 017419

CONSTRUCTION WASTE ESTIMATE **DATE: _____**

Waste Material (Edit to Suit)	Unit	Estimated Quantity Generated	Percent to Landfill	Percent Reused	Percent Recycled
Land Clearing Debris	CY				
Soil	CY				
Wood	CY				
Sheet Wood	CY				
Concrete	CY				
Bricks	CY				
Concrete Masonry Units	CY				
Asphalt Concrete	CY				
Paper	CY				
Cement Fiber Products	CY				
Metal (ferrous)	TON				
Metals (non-ferrous)	LBS				
Paint	GAL				
Rigid Foam	CF				
Glass	CF				
Plastics	CF				
Carpet and Pad	SY				
Beverage Containers	LBS				
Insulation	CF				
Gypsum Board	CF				
Porcelain Plumbing Fixtures	EA				
Fluorescent Light Tubes	EA				

WASTE MANAGEMENT REPORT
COST / INCOME

Waste Material (Edit to Suit)	Unit	Receiving Facility	Landfill Cost			Reused		Recycled	
			Handling	Transport	Fee	Cost	Income	Cost	Income
Land Clearing Debris	CY								
Soil	CY								
Wood	CY								
Sheet Wood	CY								
Concrete	CY								
Bricks	CY								
Concrete Masonry Units	CY								
Asphalt Concrete	CY								
Paper	CY								
Cement Fiber Products	CY								
Metal (ferrous)	TON								
Metals (non-ferrous)	LBS								
Paint	GAL								
Rigid Foam	CF								
Glass	CF								
Plastics	CF								
Carpet and Pad	SY								
Beverage Containers	LBS								
Insulation	CF								
Gypsum Board	CF								
Porcelain Plumbing Fixtures	EA								
Fluorescent Light Tubes	EA								
TOTALS:									

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Inspection procedures.
2. Project Record Documents.
3. Operation and maintenance manuals.
4. Warranties.
5. Instruction of the State's personnel.
6. Final cleaning.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Make final changeover of permanent locks and deliver keys to the State. Advise the State's personnel of changeover in security provisions.
3. Complete startup testing of systems. Submit test reports.
4. Submit test/adjust/balance records.
5. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
6. Advise the State of changeover in heat and other utilities.
7. Submit changeover information related to the State's occupancy, use, operation, and maintenance.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, the State will either proceed with inspection or notify Contractor of unfulfilled requirements. The State will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by the State, that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
2. Results of completed inspection will form the basis of requirements for Final Completion.

1.3 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining date of Final Completion, complete the following:

1. Submit a final Application for Payment according to Division 1 Section 01290 "Payment Procedures."
2. Submit one copy of the State's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by the State. The copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Prepare and submit Project Record Documents, operation and maintenance manuals, Final Completion construction photographs, damage or settlement surveys, property surveys, and similar final record information.
5. Deliver tools, spare parts, extra materials, and similar items to location designated by the State. Label with manufacturer's name and model number where applicable.
6. Submit pest-control final inspection report and warranty.
7. Instruct the State's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
8. Complete final cleaning requirements, including touchup painting.
9. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, the State will either proceed with inspection or notify Contractor of unfulfilled requirements. The State will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Preparation: Submit one copy of punch list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.

1. Organize list of spaces in sequential order.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.5 PROJECT RECORD DOCUMENTS (AS-BUILTS)

A. General: Do not use Project Record Documents for construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for the State's reference during normal working hours.

B. Provide Project Record Documents in accordance with the General Conditions.

1.6 OPERATION AND MAINTENANCE MANUALS

A. Assemble two (2) complete sets of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:

1. Operation Data: Include emergency instructions and procedures, system and equipment descriptions, operating procedures, and sequence of operations.
2. Maintenance Data: Include manufacturer's information, list of spare parts, maintenance procedures, maintenance and service schedules for preventive and routine maintenance, and copies of warranties and bonds.

B. Organize operation and maintenance manuals into suitable sets of manageable size. Bind and index data in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL," Project name, and subject matter of contents.

1.7 WARRANTIES

A. Submittal Time: Submit written warranties on request of the State for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.

C. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 DEMONSTRATION AND TRAINING

A. Instruction: Instruct the State's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Provide instructors experienced in operation and maintenance procedures.
2. Provide instruction at mutually agreed-on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.
3. Schedule training with the State, with at least seven days' advance notice.
4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

B. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections. For each training module, develop a learning objective and teaching outline.

1. Include instruction for system design and operational philosophy, review of documentation, operations, adjustments, troubleshooting, maintenance, and repair.

3.2 FINAL CLEANING

A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

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

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:

    a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
    b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
    c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
    d. Remove tools, construction equipment, machinery, and surplus material from Project site.
    e. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
    f. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
    g. Sweep concrete floors broom-clean in unoccupied spaces.
    h. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
    i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
    j. Remove labels that are not permanent.
    k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

        1) Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.

    l. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
    m. Replace parts subject to unusual operating conditions.
    n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
    o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
    p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed

by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

q. Leave Project clean and ready for occupancy.

C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the State's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION 017700

SECTION 032000

CONCRETE REINFORCING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel reinforcement bars.

1.2 ACTION SUBMITTALS

A. Product Data: For the following:

1. Each type of steel reinforcement.

B. Sustainable Design Submittals:

1. Provide Environmental Product Declarations (EPD) as informational submittals for reinforcing steel. EPD's must be a facility-specific manufacturer declaration that is independently verified.
2. Global Warming Potential (GWP) limits for reinforcing steel:
   a. Maximum GWP: 755 kg CO2eq. or 7.55E+02 kg CO2eq. for one metric ton of bar.

C. Shop Drawings: Comply with ACI SP-066:

1. Include placing drawings that detail fabrication, bending, and placement.
2. Include bar sizes, lengths, materials, grades, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, location of splices, lengths of lap splices, details of mechanical splice couplers, details of welding splices, tie spacing, hoop spacing, and supports for concrete reinforcement.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60, deformed.

2.2 REINFORCEMENT ACCESSORIES

A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded-wire reinforcement in place.

1. Manufacture bar supports from steel wire, plastic, or precast concrete in accordance with CRSI's "Manual of Standard Practice." Precast concrete supports shall have a compressive strength greater than that specified for the surrounding concrete.

B. Steel Tie Wire: ASTM A1064/A1064M, annealed steel, not less than 0.0508 inch in diameter.

1. Finish: Plain.

2.3 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

PART 3 - EXECUTION

3.1 PREPARATION

A. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete.

3.2 INSTALLATION OF STEEL REINFORCEMENT

A. Comply with CRSI's "Manual of Standard Practice" for placing and supporting reinforcement.

B. Accurately position, support, and secure reinforcement against displacement.

1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

3.3 INSTALLATION TOLERANCES

A. Comply with ACI 117.

END OF SECTION 032000

SECTION 033000

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place concrete, including concrete materials, mixture design, placement procedures, and finishes.

1.2 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash, slag cement, and other pozzolans materials subject to compliance with requirements.

B. Water/Cement Ratio (w/cm): The ratio by weight of water to cementitious materials.

1.3 ACTION SUBMITTALS

A. Product Data: For each of the following.

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Aggregates.
6. Admixtures:

    a. Include limitations of use, including restrictions on cementitious materials, supplementary cementitious materials, air entrainment, aggregates, temperature at time of concrete placement, relative humidity at time of concrete placement, curing conditions, and use of other admixtures.
7. Curing materials.

B. Design Mixtures: For each concrete mixture, include the following:

1. Mixture identification.
2. Minimum 28-day compressive strength.
3. Durability exposure class.
4. Maximum w/cm.
5. Calculated equilibrium unit weight, for lightweight concrete.
6. Slump limit.

7. Air content.
8. Nominal maximum aggregate size.
9. Indicate amounts of mixing water to be withheld for later addition at Project site if permitted.
10. Intended placement method.
11. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.4 INFORMATIONAL SUBMITTALS

A. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Curing compounds.

B. Material Test Reports: For the following, from a qualified testing agency:

1. Portland cement.
2. Fly ash.
3. Slag cement.
4. Blended hydraulic cement.
5. Aggregates.
6. Admixtures:

C. Research Reports: For concrete admixtures in accordance with ICC's Acceptance Criteria AC198.

D. Mixture Qualification Data: For each concrete mixture, submit historical field strength test records or laboratory trial-mixture test reports demonstrating compliance with ACI 301.

E. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Ready-Mixed Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified in accordance with NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Testing: Established ready-mix concrete mixtures supported by historical field strength test records demonstrating compliance with ACI 301 are

acceptable, subject to review by the Structural Engineer. Where adequate supporting records are unavailable, engage a qualified testing agency to perform laboratory trial-mixture testing.

1. Include the following information in each test report:

    a. Admixture dosage rates.
    b. Slump.
    c. Air content.
    d. Seven-day compressive strength.
    e. 28-day compressive strength.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Comply with ASTM C94/C94M and ACI 301.

1.8 FIELD CONDITIONS

A. Cold-Weather Placement: Comply with ACI 301 and ACI 306.1.

B. Hot-Weather Placement: Comply with ACI 301 and ACI 305.1.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless modified by requirements in the Contract Documents.

2.2 CONCRETE MATERIALS

A. Cementitious Materials:

1. Portland Cement: ASTM C150/C150M, Type I, Type II or Type I/II.
2. Fly Ash: ASTM C618, Class C or F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.
4. Blended Hydraulic Cement: ASTM C595/C595M, Type IL, portland-limestone cement.

B. Normal-Weight Aggregates: ASTM C33/C33M, graded. Provide aggregates from a single source.

1. Alkali-Silica Reaction: Comply with one of the following:

    a. Expansion Result of Aggregate: Not more than 0.04 percent at one-year when tested in accordance with ASTM C1293.

b. Expansion Results of Aggregate and Cementitious Materials in Combination: Not more than 0.10 percent at an age of 16 days when tested in accordance with ASTM C1567.
c. Alkali Content in Concrete: Not more than 4 lb./cu. yd. for moderately reactive aggregate or 3 lb./cu. yd. for highly reactive aggregate, when tested in accordance with ASTM C1293 and categorized in accordance with ASTM C1778, based on alkali content being calculated in accordance with ACI 301.

2. Maximum Coarse-Aggregate Size: 3/4 inch nominal.
3. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Air-Entraining Admixture: ASTM C260/C260M.

D. Chemical Admixtures: Certified by manufacturer to be compatible with other admixtures that do not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.
2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and -Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

E. Water and Water Used to Make Ice: ASTM C94/C94M, potable.

2.3 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film burlap-polyethylene sheet.

1. Color:

a. Ambient Temperature Below 50 deg F: Black.
b. Ambient Temperature between 50 deg F and 85 deg F: Any color.
c. Ambient Temperature Above 85 deg F: White.

C. Curing Paper: 8-feet-wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

D. Water: Potable or complying with ASTM C1602/C1602M.

E. Membrane-Forming Curing Compound: ASTM C309, Type 1, clear, waterborne, suitable for exterior concrete.

2.4 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, in accordance with ACI 301.

1. Use a qualified testing agency for preparing and reporting proposed mixture designs, based on laboratory trial mixtures.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash or Other Pozzolans: 25 percent by mass.
2. Slag Cement: 50 percent by mass.
3. Total of Fly Ash or Other Pozzolans, Slag Cement: 50 percent by mass, with fly ash or pozzolans not exceeding 25 percent by mass.

C. Admixtures: Use admixtures in accordance with manufacturer's written instructions.

1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
2. Use water-reducing and -retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
3. Use water-reducing admixture in pumped concrete, and concrete with a w/cm below 0.50.

2.5 CONCRETE MIXTURES

A. Class A: Normal-weight concrete used for footings and foundation walls.

1. Exposure Class: ACI 318 W1.
2. Minimum Compressive Strength: 4000 psi at 28 days.
3. Maximum w/cm: 0.50.

2.6 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete in accordance with ASTM C94/C94M, and furnish batch ticket information.

PART 3 - EXECUTION

3.1 INSTALLATION OF EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining Work that is attached to or supported by cast-in-place concrete.

1. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
2. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of ANSI/AISC 303.
3. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3.2 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, embedded items, and vapor retarder is complete and that required inspections are completed.

1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.
2. Provide continuous inspection of vapor retarder during concrete placement and make necessary repairs to damaged areas as Work progresses.
3. Before placing concrete in piers, verify excavation dimensions and that excavation walls are stable. Remove loose soil, debris, and standing water. Notify the State Representative, Structural Engineer, and geotechnical representative if caving, soft soil, uncontrolled fill, or groundwater is encountered. Correct unsuitable conditions and obtain acceptance of the excavation by the geotechnical representative before placing concrete.

B. Notify the State Representative and testing and inspection agencies 24 hours prior to commencement of concrete placement.

C. Before test sampling and placing concrete, water may be added at Project site in accordance with ASTM C94/C94M and ACI 301. Do not exceed the amount of additional water permitted on the concrete delivery ticket or the maximum w/cm of the approved mixture. Record the quantity of water added on the delivery ticket.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness.

1. If a section cannot be placed continuously, provide construction joints as indicated.
2. Deposit concrete to avoid segregation.
3. Deposit concrete in horizontal layers of depth not to exceed formwork design pressures and in a manner to avoid inclined construction joints.
4. Consolidate placed concrete with mechanical vibrating equipment in accordance with ACI 301.

    a. Do not use vibrators to transport concrete inside forms.
    b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
    c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
    d. At each insertion, limit duration of vibration to time necessary to consolidate concrete, and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
5. Place each concrete pier continuously from bottom to top. Construction joints within piers are not permitted unless approved by the Structural Engineer before placement.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Do not place concrete floors and slabs in a checkerboard sequence.
2. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
3. Maintain reinforcement in position on chairs during concrete placement.
4. Screed slab surfaces with a straightedge and strike off to correct elevations.
5. Level concrete, cut high areas, and fill low areas.
6. Slope surfaces uniformly to drains where required.
7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface.
8. Do not further disturb slab surfaces before starting finishing operations.

3.3 CONCRETE CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

1. Comply with ACI 301 and ACI 306.1 for cold weather protection during curing.
2. Comply with ACI 301 and ACI 305.1 for hot-weather protection during curing.
3. Maintain moisture loss no more than 0.2 lb/sq. ft. x h, calculated in accordance with ACI 305.1, before and during finishing operations.

B. Curing Formed Surfaces: Comply with ACI 308.1 as follows:

1. Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces.
2. Cure concrete containing color pigments in accordance with color pigment manufacturer's instructions.
3. If forms remain during curing period, moist cure after loosening forms.
4. If removing forms before end of curing period, continue curing for remainder of curing period, as follows:
   a. Continuous Sprinkling: Maintain concrete surface continuously wet.
   b. Absorptive Cover: Pre-dampen absorptive material before application; apply additional water to absorptive material to maintain concrete surface continuously wet.
   c. Water-Retention Sheeting Materials: Cover exposed concrete surfaces with sheeting material, taping, or lapping seams.
   d. Membrane-Forming Curing Compound: Apply uniformly in continuous operation by power spray or roller in accordance with manufacturer's written instructions.

      1) Recoat areas subject to heavy rainfall within three hours after initial application.
      2) Maintain continuity of coating and repair damage during curing period.

C. Curing Unformed Surfaces: Cure exposed tops of concrete piers in accordance with ACI 301 for not less than seven days. Begin curing promptly after finishing using continuous moist curing, moisture-retaining covers, or the specified membrane-forming curing compound. Apply and maintain curing compound in accordance with manufacturer's written instructions. Maintain continuous moisture protection throughout the curing period.

3.4 TOLERANCES

A. Conform to ACI 117.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: The State will engage an independent inspection agency to perform special inspections indicated in the Special Inspection Schedule on the Drawings and prepare inspection reports.

B. Testing Agency: The State will engage a qualified independent testing agency to perform required field tests and submit reports.

C. Contractor Responsibilities: Coordinate inspections and testing, provide access and assistance, and give the notifications required by the Drawings. State-provided inspection and testing do not relieve the Contractor of responsibility for construction quality control or compliance with the Contract Documents.

END OF SECTION 033000

SECTION 044313

STONE MASONRY

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. River Rock Cobble Edge.
2. Stone Fire Ring.

B. Related Requirements:

1. Section 033000 “Cast-In-Place-Concrete” for concrete backup.

1.2 ACTION SUBMITTALS

A. Product Data: For each variety of stone and manufactured products.

B. Samples for Initial Selection:

1. For each stone type indicated, include at least five representative samples showing full range of color and other visual characteristics of the completed Work.
2. For each mortar color required: Provide samples for verification. Label samples to indicate types and amounts of pigment used.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: Work shall be performed by a qualified installer who employs experienced stone fitters.

B. Mockups: Build mockups to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Adhered Stone Masonry: Build full-size mockup of typical stone masonry adhered to concrete footing as shown on Drawings.
    a. Include stone termination at top of footing.

b. Include proposed treatment of outside corner conditions.

c. Include stone termination at bottom of footing.

2. Random Rubble Masonry: Construct mockup at full wall height and minimum two (2) feet long with representative curvature as indicated on the Drawings.

a. Include full wall thickness, batter, face, back, and top-of-wall condition.

b. Include representative range of stone sizes, shapes, color variation, and mortar joints.

c. Include representative grouted interior construction.

d. Demonstrate proposed workmanship standard for stone selection, fit, joint treatment, and overall appearance.

e. Approved mockup may remain as part of completed work if accepted by State Park Representative.

3. Protect accepted mock-ups.

4. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless State Park Representative specifically approves such deviations in writing.

5. Approved mockups shall establish the standard for appearance, color range, texture, joint treatment, and workmanship.

6. Subject to compliance requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store setting materials in original, unopened containers bearing manufacturer’s labels. Store materials in accordance with manufacturer’s written instructions and protect from moisture, contamination, temperature extremes, and physical damage. Discard materials that have become wet, deteriorated, or otherwise damaged.

B. Store loose cobbles where characteristics can be maintained and contamination avoided.

1.6 FIELD CONDITIONS

A. Protection of Stone Masonry: During construction, cover completed areas with waterproof sheeting at end of each day's Work. Cover partially completed stone masonry when construction is not in progress.

B. Stain Prevention: Immediately remove mortar and soil to prevent them from staining the stone masonry face.

1. Protect base of footings from rain-splashed mud and mortar splatter, using covering spread on the ground and over the footing surface.

2. Protect adjacent surfaces from mortar droppings.

C. Hot Weather Requirements: Comply with hot-weather construction requirements contained in TMS 602/ACI 530.1/ASCE 6.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Stone: Obtain River Cobbles from a single quarry or source with resources to provide materials of consistent quality in appearance and physical properties.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of uniform quality for each cementitious component from a single manufacturer.

2.2 RIVER COBBLE EDGE STONE

A. Material: Naturally rounded river cobble suitable for exterior adhered veneer applications.

1. Cobbles shall be hard, dense, durable stone free of defects that would impair strength, durability, or appearance.

2. Stone shall be free of cracks, fractures, seams, laminations, weathered surfaces, friable areas, and other conditions likely to result in failure during installation or service.

B. Size and Shape: Provide cobbles with generally rounded exposed faces and at least one sawn or naturally flat bearing surface suitable for mortar setting.

1. Nominal size: 2 to 4 inches.

2. Thickness shall be sufficient to permit secure installation and full mortar bedding.

C. Appearance: Surface texture shall be naturally smooth and water-worn with exposed faces free of soil, clay, organic matter, coatings, and other foreign materials.

1. Color: Natural color range as approved by State Park Representative.

2. Provide a consistent blend of sizes, colors, and textures throughout the Work.

D. Source: Stone may be sourced from any quarry or supplier capable of providing material complying with specified requirements.

E. Quality: Reject stones exhibiting visible fractures, unstable inclusions, excessive weathering, or other defects unsuitable for the intended application.

1. Match approved samples for color range, size distribution, texture, and overall appearance.

2.3 RANDOM RUBBLE MASONRY STONE

A. Material: Naturally rounded river cobble suitable for mortared random rubble masonry construction.

1. Stone shall be hard, dense, durable, and free from defects that would impair strength, durability, or appearance.

2. Stone shall be free of cracks, fractures, seams, laminations, unstable inclusions, weathered surfaces, friable areas, and other conditions likely to result in failure during installation or service.

B. Size:

1. Provide stones ranging from 8 inches to 14 inches in largest dimension.

2. Include a representative distribution of larger stones ranging from 14 inches to 18 inches in largest dimension.

3. Stones smaller than 6 inches in largest dimension shall not predominate and shall not be used as principal structural units of the wall.

C. Shape:

1. Provide naturally rounded river cobbles with irregular forms characteristic of water-worn stone.

2. Stones shall include natural bearing surfaces suitable for stable placement in mortared masonry construction.

D. Appearance:

1. Surface texture shall be naturally smooth and water-worn.

2. Color: Natural color range as approved by State Park Representative.

3. Provide consistent blend of sizes, colors, and textures throughout the work.

E. Source: Stone may be sourced from any quarry or supplier capable of providing material complying with specified requirements.

F. Quality: Reject stones exhibiting visible fractures, unstable inclusions, excessive weathering, or other defects unsuitable for the intended application.

1. Match approved samples for color range, size distribution, texture, and overall appearance.

2.4 RIVER COBBLE EDGE MASONRY MATERIALS

A. Mortar: Type S masonry mortar complying with ASTM C270.

1. Color: Natural gray unless otherwise indicated.

B. Bonding Agent: Where indicated or recommended by manufacturer, provide acrylic latex bonding agent compatible with concrete substrate and mortar.

C. Accessory Materials: Provide materials recommended by manufacturer for complete installation.

D. Cleaning Materials: Use cleaning materials recommended by manufacturer.

1. Do not use cleaners containing acids or other materials that may stain, etch, or damage cobbles, mortar, or adjacent surfaces.

2.5 RANDOM RUBBLE MASONRY MATERIALS

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agent, ant-freeze compounds, or other admixtures unless otherwise indicated.

A. Mortar: Medium-duty refractory mortar conforming to ASTM C199.

1. Color: Natural gray unless otherwise approved.

B. Grout: Sanded grout suitable for filling interior voids and consolidating random rubble masonry construction.

1. Compressive strength not less than 2,000 psi at 28 days.

C. Accessory Materials: Provide materials recommended by manufacturer for complete installation.

D. Temperature resistance to 2000 degrees F.

E. Water: Potable.

2.6 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar and grout stains, efflorescence, and other new construction stains from stone masonry surfaces without discoloring or damaging masonry surfaces; expressly approved for intended use by cleaner manufacturer and stone producer.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Diedrich Technologies, Inc.

b. Dominion Restoration Products.

c. EaCo Chem, Inc.

d. Hydrochemical Techniques, Inc.

e. Prosoco, Inc.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine surfaces indicated to receive stone masonry, with installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of stone masonry.

1. Verify substrates are sound, clean, dry, and suitable for installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates in accordance with manufacturer’s written instructions.

1. Remove dirt, dust, laitance, curing compounds, loose materials, and other substances that may interfere with bond.

B. Clean surfaces of river cobbles: remove all soil, stains, and foreign materials before setting.

1. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water.

2. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives.

3.3 RIVER COBBLE EDGE MASONRY

A. Prepare keyed concrete substrate.

B. Place mortar setting bed to depth indicated.

C. Sort stone before it is placed in wall to remove stone that does not comply with requirements relating to aesthetic effects, physical properties, or that is otherwise unsuitable for intended use.

D. Firmly set cobbles into fresh mortar.

1. Arrange stones with color and size variations uniformly dispersed for an evenly blended appearance.

2. Maintain alignment, spacing, and exposed cobble profile consistent with approved mockup.

E. Maintain uniform joint widths, except for variations due to different stone sizes and where minor variations are required to maintain bond alignment.

1. Set stones with joints not less than 3/8 inch at narrowest points or more than 1 inch at widest points.

3.4 RANDOM RUBBLE MASONRY

A. Construct wall to dimensions, batter, radii, and profiles indicated on Drawings.

B. Place stones to achieve an interlocked masonry assembly with mortar-bed bearing between adjacent stones.

C. Distribute larger stones uniformly throughout the work.

D. Orient stones to extend substantially into the wall section and avoid construction consisting of independent interior and exterior faces.

E. Maintain uniform joint widths, except for variations due to different stone sizes and where minor variations are required to maintain bond alignment.

1. Set stones with joints not less than 1/2 inch at narrowest points or more than 1-1/2 inches at widest points.

2. Avoid continuous vertical joints and large concentrations of small filler stones.

F. Fill interior voids with mortar and grout as indicated and fully consolidate masonry assembly.

G. Maintain consistent batter and top-of-wall alignment throughout construction.

H. Finished work shall match the approved mockup with respect to joint treatment, workmanship, and overall character.

3.5 POINTING

A. Prepare stone-joint surfaces for pointing with mortar by removing dust and mortar particles. Where setting mortar was removed to depths greater than surrounding areas, apply pointing mortar in layers not more than 3/8 inch deep until a uniform depth is formed.

B. Point stone joints by placing and compacting pointing mortar in layers of not more than 3/8 inch deep. Compact each layer thoroughly and allow to it become thumbprint hard before applying next layer.

C. Tool joints, when pointing mortar is thumbprint hard, with a smooth jointing tool to produce the following joint profile:

1. Joint Profile: Concave recessed 1/4 inch below edges of stone (raked joint) finished smooth.

3.6 ADJUSTING AND CLEANING

A. In-progress Cleaning: Clean stone masonry as work progresses. Remove mortar fins and smears before tooling joints.

B. Final Cleaning: After mortar is thoroughly set and cured, clean stone masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.

2. Test cleaning methods on mockup; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before cleaning stone masonry.

3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.

4. Wet wall surfaces with water before applying cleaner; remove cleaner promptly by rinsing thoroughly with clear water.

5. Clean stone masonry by bucket and brush hand-cleaning method described in BIA Technical Note No. 20, Revised II, using job-mixed detergent solution.

6. Clean stone masonry with proprietary acidic cleaner applied according to manufacturer's written instructions.

3.7 EXCESS MATERIALS AND WASTE

A. Excess Stone: Stack excess stone where directed by State’s Representative for State’s use.

B. Remove and legally dispose of excess mortar, grout, and masonry waste.

3.8 PROTECTION

A. Protect completed work from damage during construction.

END OF SECTION 044313

SECTION 051200

STRUCTURAL STEEL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel.
2. Shear Stud Connectors.

1.2 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in ANSI/AISC 303.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Structural-steel materials.
2. High-strength, bolt-nut-washer assemblies.
3. Anchor rods.
4. Shrinkage-resistant grout.

B. Sustainable Design Submittals:

1. Provide Environmental Product Declarations (EPD) as informational submittals for reinforcing steel. EPD's must be a facility-specific manufacturer declaration that is independently verified.
2. Global Warming Potential (GWP) limits for structural steel:
    a. Maximum GWP for hot-rolled structural steel sections: 1,010 kg CO2eq. or 1.01E+03 kg CO2eq. for one metric ton of bar.
    b. Maximum GWP for hollow structural steel sections: 1,710 kg CO2eq. or 1.71E+03 kg CO2eq. for one metric ton of bar.
    c. Maximum GWP for steel plate: 1,490 kg CO2eq. or 1.49E+03 kg CO2eq. for one metric ton of bar.

C. Shop Drawings: Show fabrication of structural-steel components.

1.4 INFORMATIONAL SUBMITTALS

A. Welding certificates.

B. Mill test reports for structural-steel materials, including chemical and physical properties.

C. Source quality-control reports.

D. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU or is accredited by the IAS Fabricator Inspection Program for Structural Steel (Acceptance Criteria 172).

B. Installer Qualifications: A qualified Installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector.

C. Welding Qualifications: Qualify procedures and personnel in accordance with AWS D1.1/D1.1M.

PART 2 - PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. Plate and Bar: ASTM A36/A36M.

B. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C structural tubing.

C. Steel Pipe: ASTM A53/A53M.

D. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS AND CONNECTORS

A. High-Strength A325 Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 3, heavy-hex steel structural bolts; ASTM A563, Grade C3 or DH3, heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 3, hardened carbon-steel washers; all with plain finish.

B. Shear Stud Connectors: ASTM A108, AISI C-1015 through C-1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

2.3 RODS

A. Threaded Rods with Double-nut Assembly: ASTM A1554, Grade 36.

1. Finish: Plain.

2.4 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate in accordance with ANSI/AISC 303 and to ANSI/AISC 360.

2.5 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

2.6 SOURCE QUALITY CONTROL

A. Special Inspections: Engage a special inspector to perform field tests and inspections and prepare testing and inspection reports.

B. Testing Agency: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Provide special inspections as indicated in the Special Inspection Schedule on the Drawings

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify, with certified steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and in accordance with ANSI/AISC 303 and ANSI/AISC 360.

B. Baseplates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate (where indicated).
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack shrinkage-resistant grout solidly between bearing surfaces and plates, so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for grouting.

C. Maintain erection tolerances of structural steel within ANSI/AISC 303.

3.3 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts in accordance with RCSC's "Specification for Structural Joints Using High-Strength Bolts" for bolt and joint type specified.

1. Joint Type: Snug tightened.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with ANSI/AISC 303 and ANSI/AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.

3.4 FIELD QUALITY CONTROL

A. Special Inspections: The State will engage an independent inspection agency to perform special inspections indicated in the Special Inspection Schedule on the Drawings and prepare inspection reports.

B. Testing Agency: The State will engage a qualified independent testing agency to perform required field tests and submit reports.

C. Contractor Responsibilities: Coordinate inspections and testing, provide access and assistance, and give the notifications required by the Drawings. State-provided inspection and testing do not relieve the Contractor of responsibility for construction quality control or compliance with the Contract Documents.

END OF SECTION 051200

SECTION 055010

LANDSCAPE METAL WORK

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes: Requirements for furnishing and installing metal fabrications made from steel shapes, plates, bars, strips, tubes, pipes and castings not a part of structural steel or specified in other Sections, including but not limited to the following items:

1. Campfire bench hardware & accessories
2. Hose bib accessories
3. Camp host water hookup accessories
4. Wood Screen Fence ‘A’ and fence accessories
5. Wood Screen Fence ‘B’ and fence accessories
6. Campfire center entry sign accessories
7. Path Light and Pole light accessories
8. Campfire Center Cookie accessories
9. Projector Podium accessories
10. 22’ Swing Gate accessories
11. Campfire Center Cookie accessories

Related Sections

B. Section 061010 - Exterior Landscape Carpentry
C. Section 051200 – Structural Steel Framing

1.2 ACTION SUBMITTALS

A. Shop Drawings: Show fabrication and installation details for landscape metal work.
B. Include plans, elevations, component details, and attachment details.
C. Indicate materials and profiles of each landscape metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.
D. Both steel and wood shop drawings to be coordinated and submitted as a package at the same time for review.

1.3 QUALITY ASSURANCE

A. Mockups: Build mockups to demonstrate aesthetic effects, and to set quality standards for fabrication and installation.
Build mockups for the following types of landscape metal work:
Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

B. Welding Qualifications: Qualify procedures and personnel in accordance with the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel.
2. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Ferrous Metals
   1. For fabrication of metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
   2. Steel Plates, Shapes and Bars: ASTM A36.
   3. Steel Tubing: Cold-formed, ASTM A500 or hot rolled, ASTM A501; 0.125-inch thick wall thickness unless otherwise indicated.
   4. Structural Steel Sheet: Hot rolled, ASTM A570; or cold rolled ASTM A611, Class 1.
   5. Galvanized Structural Steel Sheet: ASTM A653, galvanized in accordance with ASTM A525, G90 coating designation.
   6. Steel Pipe: ASTM A53; type and grade selected by fabricator; black finish unless galvanizing is indicated or specified; standard weight, schedule 40, unless otherwise indicated.
   7. Gray Iron Castings: ASTM A48, Class 30.
   8. Malleable Iron Castings: ASTM A47, grade selected by fabricator.

B. Stainless Steel: Class 316.
   1. Tubing: ASTM A554
   2. Pipe: ASTM A312.
   3. Castings: ASTM A743.
   4. Castings: ASTM A743.
   5. Plate: ASTM A167.
   6. Threaded Rod: ASTM F593, and ASTM F594, Alloy Group 1 or 2.

C. Fasteners:
   1. Exterior Fasteners: Type 316 Stainless Steel.
   2. Interior Fasteners: ASTM A307 unless otherwise indicated.
   3. Bolts, Threaded Rods, Nuts, and Washers: ASTM F593 and ASTM F594.
   4. Expansion Anchors: Stainless Steel.

D. Weathering Steel:
   1. ASTM A588, A242, A871-65 for applications as shown on drawings.
   2. Shapes and gauge as indicated on drawings.

E. Miscellaneous Metal Fabrications
   1. Loose Bearing and Leveling Plates: Provide for steel items bearing on masonry or concrete construction, made flat, free from warps or twists, and of required thickness and bearing area. Drill to receive anchor bolts, all thread rods, and for grouting as required. Galvanize after fabrication.

F. Miscellaneous Framing and Supports:
   1. Provide miscellaneous framing and supports not a part of structural

steel framework, as required to complete work.
2. Fabricate to sizes, shapes and profiles shown or required.
3. Fabricate from structural steel shapes and plates and steel bars of welded construction using mitered joints for field connection.
4. Cut, drill and tap units to receive hardware and similar items.
5. Furnish integrally welded anchors for casting into concrete or building into masonry.
6. Finish: Hot-dip galvanize exterior frames and supports, shop prime interior frames and supports.

G. Stainless Steel Sheet and Plate Finishes:
1. Directional Satin Finish: ASTM A480/A480, No. 4.
2. Mirror Finish: ASTM A480/A480M, No. 8.

H. Wood Construction Connectors:
1. Manufacturers: Simpson Strong-Tie or equal.
2. Provide manufactured steel connectors, ties, straps, anchors, hold-downs, post-bases, post caps, angle clips, and related hardware as required to complete installation as indicated on the Drawings.
3. Carbon Steel Connectors: ASTM A653 galvanized steel, ASTM A36 steel, or ASTM A1011 steel as applicable to connector type and manufacturer standards.
4. Stainless Steel Connectors: Type 316 stainless steel where indicated or where connectors are exposed to coastal, marine, or other corrosive environments.
5. Exterior Connector Finish: Hot-dip galvanized after fabrication in accordance with ASTM A154 or manufacturer’s ZMAX/G185 coating.
6. Fasteners: Provide manufacturer’s specified nails, screws, bolts, washers, and anchors. Exterior fasteners shall be hot-dip galvanized or Type 316 stainless steel as appropriate for exposure conditions.
7. Installation: Install connectors in accordance with manufacturer’s published instructions. Field modification of connectors is prohibited unless approved by the manufacturer or engineer.

I. Hinges:
1. Heavy-duty weld-on barrel hinges designed for exterior steel swing gates.
2. Hinges shall be greaseable and serviceable after installation.
3. Minimum hinge pin diameter: 1 inch.
4. Provide three hinges per gate leaf unless otherwise indicated.
5. Hinges shall be capable of supporting gate weight and intended operating loads without binding, excessive deflection, or deformation.
6. Hinges shall be fabricated from steel compatible with gate construction and finish system.
7. Basis of Design: Locinox Mammoth hinge system or approved equal.

2.2 FABRICATION

A. Cut, drill, and punch metals cleanly and accurately.
   1. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated.
   2. Remove sharp or rough areas on exposed surfaces.

B. Form work true to line and level with accurate angles and surfaces.

C. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove flux immediately.
   4. At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Finish #1 welds; ornamental quality with no evidence of a welded joint.

D. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.

E. Form changes in direction as follows:
   1. As detailed.

F. Bend members in jigs to produce uniform curvature for each configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.

G. Close exposed ends of hollow railing members with prefabricated cap and end fittings of same metal and finish as railings.

H. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.

I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.

J. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work.
   1. Fabricate anchorage devices capable of withstanding loads imposed by railings.
   2. Coordinate anchorage devices with supporting structure.

K. For railing posts set in concrete, provide stainless steel sleeves not less than 6 inches long with inside dimensions not less than 1/2 inch greater than outside dimensions of post, with metal plate forming bottom closure.

L. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

M. Hinges: Install hinges plumb and aligned to permit smooth operation without binding.
   1. Adjust hinges to provide full gate movement and proper alignment.
   2. Lubricate hinges prior to substantial completion.

2.3 FINISHES

A. Finish exterior ferrous metal items with a shop-applied corrosion protection coating system consisting of:
   1. Zinc-rich primer.
   2. Intermediate epoxy coat.
   3. Aliphatic polyurethane finish coat.

B. Color: As selected by State's Representative from manufacturer's standard color chart.

C. Repair field welds, cuts, and damaged coatings in accordance with coating manufacturer's recommendations.

D. Finish Schedule:
   1. Exterior Ferrous Metals: Epoxy/polyurethane coating system.
   2. Exterior Stainless Steel: No. 4 finish unless otherwise indicated.
   3. Repair damaged finishes after fabrication and before installation.

PART 3 - EXECUTION

3.1 PREPARATION

1. Coordinate and furnish anchorages, setting drawings, diagrams, templates, instructions, and directions for installation of anchorages, such as concrete inserts, sleeves, anchor bolts and miscellaneous items having integral anchors.

3.2 INSTALLATION

1. Fastening to In Place Construction: Provide threaded fasteners for concrete and masonry inserts, toggle bolts, through ¬bolts, lag bolts, wood screws and other connectors as required.
2. Perform cutting, drilling and fitting required for installation of miscellaneous metal fabrications.
3. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.
4. Provide temporary bracing or anchors in formwork for items to be built into concrete, masonry or similar construction.
5. Fit exposed connections together forming tight hairline joints.
6. Weld connections not shop welded.
7. Grind exposed joints smooth and imperceptible, and touch up shop paint coat.
8. Do not weld, cut or abrade the surfaces of exterior units which have been hot dip galvanized after fabrication, and intended for bolted or screwed field connections.
9. Field Welding: Comply with AWS for procedures of manual shielded metal arc welding, appearance and quality of welds, and methods

used in correcting welding work.

10. Install prefabricated items in accordance with manufacturer's instructions.

END OF SECTION 055010

SECTION 061010

EXTERIOR LANDSCAPE CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

Section Includes:

1. Campfire bench
2. Hose bib water hookup
3. Camp host water hookup
4. Wood Screen Fence A
5. Wood Screen Fence B with Gate
6. Split Rail Fence
7. Campfire center entry sign
8. Path Light
9. Light Pole (At Campfire Center)
10. Projector Podium

1.2 ACTION SUBMITTALS

A. Product Data:

Photograph timber members.

1. Timber Members: Submit photographs of timber members proposed for use on the Project.
2. Metal Framing Anchors: Submit manufacturer’s product data including installation instructions.
3. Wood Preservatives, Sealers, and Finishes: Submit manufacturer’s product data for each product specified, including:
    a. Product characteristics.
    b. Surface preparation instructions and recommendations.
    c. Primer requirements and finish specifications.
    d. Storage and handling requirements and recommendations.
    e. Application methods.
    f. Clean-up Information.

B. Shop Drawings

1. Required for
    a. Campfire bench
    b. Wood Screen Fence A
    c. Wood Screen Fence B with Gate
    d. Campfire center entry sign
    e. Projector Podium
2. Show fabrication and installation details for landscape carpentry and metal work.
3. Include plans, elevations, component details, and attachment details.
4. Indicate materials and profiles of each landscape metal member, fittings, joinery, finishes, fasteners, anchorages, and accessory items.

5. Both steel and wood shop drawings to be coordinated and submitted as a package at the same time for review.

1.3 INFORMATIONAL SUBMITTALS

A. Manufacturer's Certification: Provide manufacturer's certification stating that materials furnished for the Project comply with specified requirements and are suitable for intended use.

1.4 QUALITY ASSURANCE

A. Examination: Verify conditions affecting installation are acceptable prior to commencing Work.
B. Do not proceed with installation where conditions would adversely affect completed Work. Notify State Park Representative of such conditions.
C. Reject lumber demonstrating excessive warp, bow, twist, crook, splitting, checking, decay, insect damage, mildew, mold, or other defects that adversely affect appearance or performance.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store materials under cover and protected from weather and contact with damp or wet surfaces. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

B. Preservatives and Sealers
Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer's name, label, and the following list of information:
1. Product name, and type (description)
2. Application & use instructions
3. Surface preparation
4. VOC content
5. Environmental handling and SDS
6. Batch date
7. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
8. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.
9. Handling: Maintain a clean, dry storage area to prevent contamination or damage to the coatings.

PART 2 - PRODUCTS

2.1 LUMBER, GENERAL

A. Comply with DOC PS 20 and with grading rules of lumber grading agencies certified by ALSC's Board of Review as applicable. If no grading agency is indicated, comply with the applicable rules of any rules-writing agency certified by ALSC's Board of Review.
Factory mark each item with grade stamp of grading agency.
1. For items that are exposed to view in the completed Work, omit grade stamp and provide certificates of grade compliance issued by grading agency.
2. In DOC PS 20, dressed sizes of green lumber are larger than those of dry lumber.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry wood products.
4. Provide dressed lumber, S4S, unless otherwise indicated.
5. Certified Wood: Provide FSC Chain-of Custody certified lumber where indicated.

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B. Maximum Moisture Content:
1. Boards: 15 percent.
2. Dimension Lumber: 19 percent for 2-inch nominal thickness or less; 19 percent for more than 2-inch nominal thickness.

2.2 CAMPFIRE BENCHES

A. Lumber: Custom-milled solid wood slabs as indicated on the Drawings.
B. Species: To be selected from manufacturer's standard options.
1. Imagery: Include representative images of available species in submittal for preliminary selection.
2. Physical Samples: Provide physical samples to State Representative for final verification and approval.
C. Quality: Sound, seasoned lumber for exterior use. Slabs shall be free of decay, insect damage, loose knots, bark inclusions, shake, splits, and checks that impair structural integrity, or other defects that adversely affect appearance or serviceability. Tight, sound knots and natural grain variations may be accepted.
D. Wood Surface Finish: S4S unless otherwise indicated. Ease all exposed edges. Exposed surfaces shall be sanded and free of planer marks, splinters, machine marks, and other manufacturing defects.
E. Finish: Shop-applied exterior penetrating oil finish formulated for UV resistance and water repellency. Finish shall be non-film-forming, and suitable for horizontal exterior surfaces.
1. Apply finish accordance with manufacturer’s written instructions after fabrication and prior to installation.
2. Color: Natural or as selected by State Representative.
3. Basis of Design: Penofin Verde Exterior Wood Finish or approved

equal.

2.3 SPLIT RAIL FENCE

A. Lumber: #1 Grade Western Red Cedar.
B. Quality: Premium timbers, Kiln-dried, clear, vertical grain, solid free of heart center (FOHC). There shall be no loose knots, knotholes, shake, unsound wood, whitespeck or honeycomb allowed. Timbers shall be free of wane, and planter skips are not allowed in dressing.
C. Wood sizes: As shown on drawings
D. Finish: Hand-split timbers with hewn tenons.

2.4 HEART B REDWOOD

A. Lumber: Heart B Redwood
B. Quality: Premium timbers, Kiln-dried, clear, vertical grain, solid free of heart center (FOHC). There shall be no loose knots, knotholes, shake, unsound wood, whitespeck or honeycomb allowed. Timbers shall be free of wane, and planter skips are not allowed in dressing.
C. Wood sizes: As shown on drawings
D. Finish: Rough saw cut. Ease all exposed edges.
E. Application:
    1. Hose bib water hookup
    2. Camp Host water hookup
    3. Wood Screen Fence A
    4. Wood Screen Fence B with Gate
    5. Campfire Entry Sign
    6. Projector Podium

2.5 PATH LIGHT AND LIGHT POLE

A. Lumber: #1 Grade Western Red Cedar.
B. Quality: Premium timbers, Kiln-dried, clear, vertical grain, solid free of heart center (FOHC). There shall be no loose knots, knotholes, shake, unsound wood, whitespeck or honeycomb allowed. Timbers shall be free of wane, and planter skips are not allowed in dressing.
C. Wood sizes: As shown on drawings
D. Finish: Rough saw cut. Ease all exposed edges.

2.6 WOOD SHAKES

A. Wood Shakes: Western Red Cedar, No. 1 Grade, 100 percent end grain.
B. Size: 6 inch exposure.
C. Installation: Install in accordance with manufacturer's written instructions. Provide corrosion resistant fasteners suitable for cedar wood shake roofing.

2.7 FASTENERS

A. General: Provide fasteners and connectors of size and type indicated and required for complete installation.
    1. Provide screws of sufficient length to penetrate not less than 1-1/2 inches into wood substrate unless otherwise indicated.

2. Use Type 316 stainless steel fasteners and connectors unless otherwise indicated.

B. Bolts and Threaded Rod: Stainless-steel bolts, threaded rod, nuts, and washers complying with ASTM F593 and ASTM F594, Alloy Group 1 or 2.

C. Post Installed Anchors: Stainless-steel, torque-controlled expansion anchors complying with requirements indicated in the Drawings.

D. Metal Framing Connectors:
1. Steel angle brackets of size and configuration indicated on approved shop drawings.
2. Simpson Strong-Tie post bases and indicated on Drawings.
3. Other metal framing connectors as required for complete installation.

E. Wood-to-Steel Fasteners:
1. Self-tapping stainless steel screws suitable for wood-to-steel connections.

F. Corrosion Compatibility:
1. Fasteners, anchors, and connectors shall be compatible with wood species, preservative treatments, and adjacent materials.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Install manufactured products in accordance with manufacturer's written instructions.

B. Set work to required levels and lines, with members plumb, true to line, cut, and fitted. Fit work to other construction; scribe and cope as needed for accurate fit.

C. Install metal framing anchors to comply with manufacturer's written instructions.

D. Do not splice structural members between supports unless otherwise indicated.

E. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

F. Sort and select lumber so that natural characteristics do not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of members or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

G. Securely attach exterior rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

H. Comply with applicable fastening requirements of the International Building Code.

I. Select fasteners of size that do not fully penetrate members where opposite side is exposed to view. Make tight connections between members. Install fasteners without splitting wood.

J. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced and with adjacent rows staggered.

END OF SECTION 061010

SECTION 061070

EXTERIOR TIMBER ELEMENTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Campfire Center Cookie Type A
2. Campfire Center Cookie Type B

1.2 RELATED REQUIREMENTS

A. Section 033300 “Cast-in-Place Concrete” for footings.

B. Section 055010 “Landscape Metal Work” for steel spacer.

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Indicate timber cookie dimensions, thicknesses, species, attachment details, steel spacer dimensions, hardware, and anchorage.
2. Indicate relationship between timber cookie anchorage, and concrete footing.
3. Include hole locations, dowel sizes, embedment depths, and connection details.

1.4 INFORMATIONAL SUBMITTALS

A. Digital photos of logs proposed for reuse.

1.5 QUALITY ASSURANCE

A. Mockups: Provide one full-size mockup of each Cookie type to demonstrate aesthetic effects and to set quality standards for materials and execution.

1. Protect accepted mockups.

2. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless State Park Representative specifically approves such deviations in writing.

3. Approved mockups shall establish the standard for appearance and workmanship.

4. Subject to compliance requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 DELIVERY STORAGE AND HANDLING

A. Store materials under cover protected from weather and contact with damp or wet surfaces. Stack logs flat with spacers between each log to provide air circulation. Provide air circulation around stacks and under coverings.

PART 2 – PRODUCTS

2.1 TIMBER ELEMENTS

A. Cookies: Raw material will be furnished by State Parks and milled, fabricated, and installed by Contractor.

B. Cookie Type A

1. Diameter: 18 inches minimum to 26 inches maximum.

2. Thickness: As indicated in the Drawings. Provide uniform thickness within 1/4 inch for each timber cookie.

3. Species: As provided by CA State Parks.

B. Cookie Type B

1. Diameter: 28 inches minimum to 36 inches maximum.

2. Thickness: As indicated in the Drawings. Provide uniform thickness within 1/4 inch for each timber cookie.

3. Species: As provided by CA State Parks.

2.1 ACCESSORY MATERIALS

A. Threaded Rod: Stainless Steel threaded rod as indicated on the Drawings and indicated in Section 055010.

B. Adhesive Anchoring Material: Two-component structural epoxy suitable for anchorage of threaded rod into wood and concrete.

1. Provide manufacturer's recommended accessories for complete installation.

PART3 – EXECUTION

3.1 EXAMINATION

A. Examine salvaged logs upon receipt and notify State's Representative of defects that may impair fabrication, appearance, or intended use.

3.2 PREPARATION

A. Fabricate timber cookies from salvaged logs as indicated in the Drawings.

B. Verify dimensions, thicknesses, and support conditions prior to fabrication.

3.3 CUTTING AND FINISHING

A. Debark logs unless otherwise indicated in the Drawings.

B. Cut timber cookies to thickness indicated.

C. Finished surfaces shall be free of loose bark, splinters, protuberances, and other irregularities that may create a hazard to users.

D. Ease exposed edges and sand exposed surfaces smooth.

E. Fill or repair defects only where specifically approved by State's Representative.

F. Finish all wood surfaces with a shop-applied oil finish.

1. Oil Finish: Penofin or approved equal.

2. Apply finish in accordance with manufacturer's written after fabrication and before installation.

3.4 INSTALLATION

A. Install timber cookies as indicated in the Drawings.

B. Set timber cookies level and plumb on supports indicated.

C. Secure timber cookies to steel support assembles using threaded rod, adhesive anchoring materials, and hardware indicated on approved shop drawings.

D. Protect finished surfaces from damage during installation.

END OF SECTION 061070

SECTION 260010

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY:

A. This section covers general work of all sections under Division 26.

B. Provide a complete working electrical installation with all equipment called for in proper operating condition. Documents do not undertake to show or list every item to be provided. When an item not shown or listed is clearly necessary for proper operation of equipment which is shown or listed, provide the item which will allow the system to function properly at no increase in contract price.

C. Furnish and install all required in-place equipment, conduits, conductors, cables and any miscellaneous materials for the satisfactory interconnection and operation of all associated electrical systems.

D. The Division 26 Specifications and drawings are complementary; what is called for by one is binding, as if called for by both. Items shown on the drawings are not necessarily included in the specifications and vice versa.

E. Use the more stringent requirement when specified materials or methods exceed the applicable code standards.

F. The drawings that accompany the division 26 specifications are diagrammatic. They do not show every offset, bend, conduit body, elbow or junction box that may be required to install work in the space provided and avoid conflicts. Follow the drawings as closely as is practical and install additional bends, offsets and elbows where needed by local job site conditions. Provide necessary junction boxes to meet code regulations for the allowed number conduit bends. The right is reserved to make minor field order changes in outlet location prior to roughing-in without additional cost to the state.

G. All sections of Division 26, Electrical Specifications, are interrelated. Use Division 26, in its entirety, when interpreting any material, method or direction listed in any section.

H. When specified materials or methods exceed the applicable code standards, use the materials or methods specified. When materials or methods specified fall below applicable code standards, replace or modify materials or methods to meet applicable code standards. Do not provide materials or employ methods that do not conform to applicable codes and standards.

1.2 RELATED WORK:

A. This Section provides the basic Electrical Requirements which supplement the General Requirements of Division 01 and apply to all Sections of Division 26.

1.3 SUBMITTALS:

A. As specified in Division 01. Submit to the State Representative shop drawings, manufacturer's data and certificates for equipment, materials and finish, and pertinent details for each system specified. Information to be submitted includes manufacturer's descriptive literature of cataloged products, equipment, drawings, diagrams, performance and characteristic curves as applicable, test data and catalog cuts. Obtain written approval before procurement, fabrication, or delivery of the items to the job site. Partial submittals are not acceptable and will be returned without review. Furnish manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable Federal, Industry and Technical Society Publication References, and years of satisfactory service of each item required to establish contract compliance. Photographs of existing installations and data submitted in lieu of catalog data are not acceptable and will be returned without approval.

B. Forward all submittals in related groups. Individual or incomplete submittals are not acceptable.

C. Identify each item by manufacturer, brand, trade name, number, size, rating, or whatever other data is necessary to properly identify and check materials and equipment.

D. Identify each submittal item by reference to specification section paragraph in which item is specified or drawing and detail number.

E. Organize submittals in same sequence as they appear in specification sections, articles or paragraphs.

F. Electronic submittals shall be allowed provided they are acceptable per Division 01 and are formatted, organized and coordinated per this section. PDF format is acceptable. Interconnection drawings, training documents, test procedures, and O&M manuals as applicable shall be submitted timely as to not delay the project.

G. Internal wiring diagrams of equipment shall show wiring as actually furnished for this project with all optional items clearly identified as included or excluded. Clearly identify external wiring connections. Identify and obliterate superfluous material.

H. Organize submittals for equipment and items related to each specification section together as a package.

I. Proposed substitutions of products will not be reviewed or approved prior to awarding of the Contract.

J. Substitutions shall be proven to the State’s Representative to be equal or superior to the specified product. State’s Representative decision is final. The Contractor shall pay all costs incurred by the State’s Representative in

reviewing and processing any proposed substitutions whether or not a proposed substitution is accepted.

K. If a proposed substitution is rejected, the contractor shall furnish the specified product at no increase in contract price.

L. If a proposed substitution is accepted, the contractor shall be completely responsible for all dimensional changes, electrical changes, or changes to other work which are a result of the substitution. The accepted substitution shall be made at no additional cost to the state or design consultants.

M. Re-submittals will be reviewed for compliance with comment made on the original submittal only and should be marked with a resubmittal number and dated. Contractor shall respond in writing to all comments made on submittal review and identify how comment was resolved. Partial re-submittals (that do not address all comments) may be returned without review at the discretion of the State's Representative.

N. The contractor shall coordinate submittals with the work so that the project will not be delayed. This coordination shall include scheduling the different categories of submittals, so that one will not be delayed for lack of coordination with another. Time extensions will not be allowed due to failure to properly schedule submittals.

1.4 QUALITY ASSURANCE:

A. Codes: All electrical equipment and materials, including installation and testing, shall conform to the latest editions following applicable codes:

1. California Electrical Code (CEC).
2. Occupational Safety and Health Act (OSHA) standards.
3. California Building Code (CBC)
4. California Fire Code (CFC)
5. National Fire Protection Association (NFPA)
6. All applicable local codes, rules and regulations.
7. Electrical Contractor shall possess a C-10 license and all other licenses as may be required. Licenses shall be in effect at start of this contract and be maintained throughout the duration of this contract.

B. Variances: In instances where two or more codes are at variance, the most restrictive requirement shall apply.

C. Standards: Equipment shall conform to applicable standards of American National Standards Institute (ANSI), Electronics Industries Association (EIA), Institute of Electrical and Electronics Engineers (IEEE), and National Electrical Manufacturers Association (NEMA).

D. Underwriter Laboratories (UL) listing is required for all equipment and materials where such listing is offered by the Underwriters Laboratories. Provide service entrance labels for all equipment required by the CEC to have such labels.

E. The electrical contractor shall guarantee all work and materials installed under this contract for a period of one (1) year from date of acceptance by the state. Any electrical gear that is set early and used during construction shall not reduce the warranty in any form. The warranty shall begin when the equipment is turned over to the state at substantial completion.

F. All work and materials covered by this specification shall be subject to inspection at any and all times by representatives of the state. Work shall not be closed in or covered before inspection and approval by the state or his representative. Any material found not conforming with these specifications shall, within 3 days after being notified by the state, be removed from premises; if said material has been installed, entire expense of removing and replacing same, including any cutting and patching that may be necessary, shall be borne by the contractor.

1.5 CONTRACT DOCUMENTS:

A. Drawings and Specifications:

1. In the case of conflict between the drawings and specifications, the specifications shall take precedence.

2. Drawings and specifications are intended to comply with all law, ordinances, rules and regulations of constituted authorities having jurisdiction, and where referred to in the Contract Documents, said laws, ordinance, rules and regulations shall be considered as a part of said Contract Documents within the limits specified. The Contractor shall bear all expenses of correcting work done contrary to said laws, ordinance, rules and regulations if the Contractor knew or should have known that the work as performed is contrary to said laws, ordinances, rules and regulations and if the Contractor performed same (1) without first consulting the State's Representative for further instructions regarding said work and/or (2) disregarded the State's Representative instructions regarding said work.

B. Drawings: The Electrical Drawings shall govern the general layout of the completed construction.

1. Locations of equipment, panels, pullboxes, conduits, stub-ups, ground connections are approximate unless dimensioned; verify locations with the State's Representative prior to installation. For purposes of clarity, legibility, drawings are essentially diagrammatic.
2. Review the Drawings and Specification Divisions of other trades and perform the electrical work that will be required for those installations.
3. Should there be a need to deviate from the Electrical Drawings and Specifications, submit written details and reasons for all changes to the State Representative for approval.
4. The general arrangement and location of existing conduits, piping, apparatus, etc., is approximate. The drawings and specifications are for the assistance and guidance of the contractor, exact locations, distances

and elevations are governed by actual field conditions. Accuracy of data given herein and on the drawings is not guaranteed. Minor changes may be necessary to accommodate work. The contractor is responsible for verifying existing conditions. Should it be necessary to deviate from the design due to interference with existing conditions or work in progress, claims for additional compensation shall be limited to those for work required by unforeseen conditions as determined by the State Representative.

5. Dimensions, location of doors, partitions, and similar physical features shall be taken from architectural drawings for exact location of outlets to center with Architectural features, panels, etc., at the approximate location shown on Electrical drawings.
6. Verify dimensions and the correct location of equipment and coordinate with other trades for any requirement before proceeding with the roughing-in of connection.
7. Mounting heights of brackets, outlets, etc., shall be as required to suit equipment served.
8. Drawings indicate, generally, routes of all branch circuits. All runs to panels are indicated as starting from nearest outlet, pointing in direction of panel. Continue all such circuits to panel as though routes were indicated in their entirety.
9. All scaled and figured dimensions are approximate of typical equipment of the class indicated. Before proceeding with any work, carefully check and verify all dimensions, sizes, etc., with the drawings to see that the equipment being installed will fit into the spaces provided.
10. Access to Equipment: Locate starters, switches, receptacles, and pull boxes to provide easy access for operation, repair, and maintenance, and if concealed, provide layout of access doors.
11. Circuit “tags” on the electrical drawings in the form of arrows are used to indicate home runs of raceways to electrical distribution points. These tags show the circuits in each home run and the panel designation. Do not combine circuits other than those shown on the drawings without approval by the States Representative. Show the actual circuit numbers on the finished record drawing, and on the panel directory card. Provide an insulated grounding conductor in every power circuit.
12. All drawings and divisions of these specifications shall be considered as whole. The contractor shall report any apparent discrepancies to the State Representative prior to submitting bids.
13. The contractor shall be held responsible to have examined the site and compared it with the specifications and plans and to have satisfied himself as to the conditions under which the work is to be performed. He shall be held responsible for knowledge of all existing conditions whether or not accurately described. No subsequent allowance shall be made for any extra expense due to failure to make such examination.

1.6 COORDINATION:

A. Coordinate the electrical work with the other trades, code authorities, utilities and the State’s Representative.

B. Contractor shall pay all inspection and other applicable fees and procure all permits necessary for the completion of this work.

C. Where connections must be made to existing installations, properly schedule all the required work, including the power shutdown periods.

D. When two trades join together in an area, make certain that no electrical work is omitted.

E. Verify the physical dimension of each item of electrical equipment to fit the available space. Contractor is responsible for coordinating electrical equipment space requirements with the allotted space provisions, and access routes through the construction area.

F. Coordinate underground work with other contractors working on the site. Perform coordination with contractors installing storm sewer, sanitary sewer, water and irrigation lines, etc., to avoid conflicts. Common trenches may be used with other trades, provided clearances required by codes and ordinances are maintained.

1.7 JOB CONDITIONS:

A. Operations: Perform all work in compliance with Division 01.

1. Keep the number and duration of power shutdown periods to a minimum.
2. Show all proposed shutdowns and their expected duration on the construction schedule. Schedule and carry out shutdowns so as to cause the least disruption to operation of the State's facilities.
3. Carry out shutdown only after the schedule has been approved, in writing, by the owner. Submit power interruption schedule 15 days prior to date of interruption.

B. Construction Power: The contractor shall make all arrangements and pay the costs thereof for temporary services required during construction of the project, such as temporary electrical power and telephone service.

C. Upon completion of the project, remove all temporary services, equipment, material and wiring from the site as the property of the contractor.

D. Storage: Provide adequate storage for all equipment and materials which will become part of the completed facility so that it is protected from weather, dust, water, or construction operations.

1.8 DAMAGED PRODUCTS:

A. Notify the State’s Representative in writing in the event that any equipment or material is damaged. Obtain approval from the State’s Representative before making repairs to damaged products.

B. Protect from loss or damage. Replace lost or damaged materials and equipment with new at no increase in contract sum.

C. Protect equipment from weather, moisture and dust by appropriate covering. Provide and maintain heating within equipment environment to prevent condensation.

1.9 LOCATIONS:

A. General: Use equipment, materials and wiring methods suitable for the types of locations in which they are located.

B. Dry Locations: All those indoor areas which do not fall within the definition below for Wet Locations and which are not otherwise designated on the Drawings.

C. Wet Locations: All locations exposed to the weather, whether under a roof or not, unless otherwise designated on the Drawings.

1.10 SAFETY AND INDEMNITY:

A. The Contractor is solely and completely responsible for conditions of the job site including safety of all persons and property during performance of the work. This requirement will apply continually and not be limited to normal working hours. The contractor shall provide and maintain throughout the work site proper safeguards including, but not limited to, enclosures, barriers, warning signs, lights, etc. to prevent accidental injury to people or damage to property.

B. No act, service, drawing review or construction review by the State, the State's Representative or their Consultants is intended to include reviews of the adequacy of the Contractors safety measures in or near the construction site.

C. The Contractor performing work under this Division of the Specifications shall hold harmless, indemnify, and defend the State, the Engineer, their consultants, and each of their officers, agents and employees from any and all liability claims, losses, or damage arising out of or alleged to arise from bodily injury, sickness, or death of a person or persons and for all damages arising out of injury to or destruction of property arising directly or indirectly out of or in connection with the performance of the work under this Division of the Specifications, and from the Contractor's negligence in the performance of the work described in the construction contract documents, but not including liability that may be due to the sole negligence of the State, the State's Representative, their Consultants or their officers, agents and employees.

D. If a work area is encountered that contains hazardous materials, the contractor is advised to coordinate with the State and it's abatement consultant for abatement of hazardous material by the State's Representative. "Hazardous materials" means any toxic substance regulated or controlled by OSHA, EPA, State of California or local rules, regulations and laws. Nothing herein shall be

construed to create a liability for the State's Representative regarding hazardous materials abatement measures, or discovery of hazardous materials.

1.11 ACCESS DOORS:

A. The contractor shall install access panels as required where floors, walls or ceilings must be penetrated for access to electrical, control, fire alarm or other specified electrical devices. The minimum size panel shall be 14" x 14" in usable opening. Where access by a service person is required, minimum usable opening shall be 18" x 24".

B. All access doors installed lower than 7'-0" above finished floor and exposed to public access shall have keyed locks.

C. Where specific information or details relating to access panels differ from Division 26 paragraph 1.11 of these specifications, or shown on the electrical drawings and details or under other Divisions of work, those requirements shall supersede these specifications.

1.12 ARC FLASH:

A. The contractor shall install a clearly visible arc flash warning to the inside door of all panelboards and industrial control panels, as well as to the front of all switchboards and motor control centers that are a part of this project.

B. The warning shall have the following wording: line 1 "WARNING" (in large letters), line 2 "Potential Arc Flash Hazard" (in medium letters), line 3 & 4 "Appropriate Personal Protective Equipment and Tools required when working on this equipment".

PART 2 - PRODUCTS

2.1 STANDARD OF QUALITY:

A. Products that are specified by manufacturer, trade name or catalog number establish a standard of quality and do not prohibit the use of equal products of other manufacturers provided they are established to be equal to the specified product and approved by the State Representative prior to installation.

B. Material and Equipment: Provide materials and equipment that are new and are current products of manufacturers regularly engaged in the production of such products. The standard products shall have been in satisfactory commercial or industrial use for two years prior to bid opening. The two-year period includes use of equipment and materials of similar size under similar circumstances. For uniformity, only one manufacturer will be accepted for each type of product.

C. Service Support: Submit a certified list of qualified permanent service organizations including their addresses and qualification for support of the equipment. These service organizations shall be convenient to the equipment

installation and able to render service to the equipment on a regular and emergency basis during the warranty period of the contract.

D. Manufacturer's Recommendations: Where installation procedures are required to be in accordance with manufacturer's recommendations, furnish printed copies of the recommendations prior to installation. Installation of the item shall not proceed until recommendations are received. Failure to furnish recommendation shall be cause for rejection of the equipment or material.

2.2 NAMEPLATES:

A. For each piece of electrical equipment, provide a manufacturer's nameplate showing his name, location, the pertinent ratings, the model designation, and shop order number.

B. Identify each piece of equipment and related controls with a rigid laminated engraved plastic nameplate. Unless otherwise noted, nameplates shall be melamine plastic 0.125 inch thick, white with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be 0.5 by 2.5 inches unless otherwise noted. Where not otherwise specified, lettering shall be a minimum of 0.25 inch high normal block style. Engrave nameplates with the inscriptions indicated on the Drawings and, if not so indicated, with the equipment name. Securely fasten nameplates in place using two stainless steel or brass screws.

2.3 FASTENERS:

A. Fasteners for securing equipment to walls, floors and the like shall be either hot-dip galvanized after fabrication or stainless steel.

2.4 FINISH REQUIREMENTS:

A. Equipment: Refer to each electrical equipment section of these Specifications for painting requirements of equipment enclosures. Repair any final paint finish which has been damaged or is otherwise unsatisfactory, to the satisfaction of the State’s Representative.

B. Wiring System: In finished areas, paint all exposed conduits, boxes and fittings to match the color of the surface to which they are affixed.

PART 3 – EXECUTION

3.1 GENERAL METHODS

A. Examine site related work and surfaces before starting work on any section.

B. Report to the State’s Representative, in writing, conditions which will prevent proper execution of this work.

C. Beginning work of any section without reporting unsuitable conditions to the State's Representative constitutes acceptance of conditions by the contractor.

D. Perform any required removal, repair or replacement of this work caused by unsuitable conditions at no additional cost to the state.

3.2 WORKMANSHIP:

A. Ensure that all equipment and materials fit properly in their installation.

B. Perform any required work to correct improperly fit installation at no additional expense to the State.

C. All electrical equipment and materials shall be installed in a neat and workmanship manner in accordance with the "NECA-1 Standard Practices for Good Workmanship in Electrical Contracting". Workmanship of the entire job shall be first class in every respect.

D. Provide a complete properly operating system for each item of equipment called for under this work. Installation shall be in accordance to equipment manufacturer's instructions, the best industry practices and the contract documents.

E. Review shop drawings for work done by other trades.

F. The electrical drawings are diagrammatic and do not represent exact dimensions. Verify all dimensions by field measurements where indicated on plan or where exact dimensions are shown.

3.3 EQUIPMENT INSTALLATIONS:

A. Provide the required inserts, bolts and anchors, and securely attach all equipment and materials to their supports.

B. Do all the cutting and patching necessary for the proper installation of work and repair any damage done.

C. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

D. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

E. Provide complete electrical connections for all items of equipment requiring such connections, including incidental wiring, materials, devices and labor necessary for a finished working installation.

F. Verify the location and method for connecting to each item of equipment prior to roughing in. Check voltage and phase of each item of equipment before connection.

G. Make motor connections for the proper direction of rotation.

H. Furnish all code required disconnects under this work, whether specifically shown or not.

I. Restore existing disturbed work to original condition including maintenance of wiring and continuity as required.

J. Conduit Systems:

1. Worked into complete, integrated arrangement with like elements to make work neat appearing, finished.

2. Run concealed, except as shown or noted otherwise. Where exposed, install parallel with walls or structural elements: vertical runs plumb; horizontal runs level or parallel with structure as appropriate: groups racked together neatly with straight runs and bends both parallel and uniformly spaced.

3. Install as high as practicable to maintain adequate headroom shown or required. Coordinate with work of other Divisions to achieve proper headroom.

4. Clearance: Do not obstruct spaces required by code in front of electrical equipment, access doors, etc.

3.4 FIELD TEST:

A. Test shall be in accordance with Acceptance testing specifications issued by the National Electrical Testing Association (NETA).

B. Perform equipment field tests and adjustments. Properly calibrate, adjust and operationally check all circuits and components, and demonstrate as ready for service. Make additional calibration and adjustments if it is determined later that the initial adjustments are not satisfactory for proper performance. Perform equipment field test for equipment where equipment field tests are specified in the equipment Specifications. Give sufficient notice to the State's Representative prior to any test so that the tests may be witnessed.

C. Provide instruments, other equipment and material required for the tests. These shall be of the type designed for the type of tests to be performed. Test instrument shall be calibrated by a recognized testing laboratory within three months prior to performing tests.

D. Operational Tests: Operationally test all circuits to demonstrate that the circuits and equipment have been properly installed and adjusted and are ready for full-time service. Demonstrate the proper functioning of circuits in all modes of operation, including alarm conditions.

E. Re-testing will be required for all unsatisfactory tests after the equipment or system has been repaired. Re-test all related equipment and systems if required by the State's Representative. Repair and re-test equipment and systems which have been satisfactorily tested but later fail, until satisfactory performance is obtained.

F. Maintain records of each test and submit five copies to the State's Representative when testing is complete. All tests shall be witnessed by the State's Representative. These records shall include:

1. Name of equipment tested.
2. Date of report.
3. Date of test.
4. Description of test setup.
5. Identification and rating of test equipment.
6. Test results and data.
7. Name of person performing test.
8. State Representative's initials.

G. Items requiring testing shall be as noted in the additional electrical sections of these specifications.

3.5 PROTECTION OF WORK

A. Protect all electrical work and equipment against damage by other trades, weather conditions or any other causes. Equipment found damaged or in other than new condition will be rejected as defective.

B. Keep transformers, panels, luminaires and all electrical equipment covered or closed to exclude dust, dirt and splashes of plaster, cement or paint and shall be free of all such contamination before acceptance. Keep enclosures and trims in new condition, free of rust, scratches and other finish defects. If damaged, properly refinish in a manner acceptable to the State's Representative.

3.6 CUTTING AND PATCHING

A. The contractor shall do all cutting and patching required for installing his work. Any cutting which may impair the structure shall require prior approval by the State's Representative. Cutting and patching shall be done only by skilled labor of the respective trades. All surfaces shall be restored to their original condition after cutting and patching.

3.7 CLEANING EQUIPMENT:

A. At the completion of the work, all parts of the installation, including all equipment, exposed conduit, and fittings, shall be thoroughly cleaned of grease and metal cuttings. Any discoloration or other damage to parts of the building, finish, or the furnishings, due to the contractor's failure to properly clean the system, shall be repaired by the contractor.

B. The contractor shall thoroughly clean any of his exposed work requiring same.

C. Vacuum and clean the inside of all electrical and instrumentation enclosures prior to applying power.

D. The contractor shall paint scratched or blemished surfaces with the necessary coats of quick drying paint to match existing color, texture and thickness. This shall include all prime painted electrical equipment including but not limited to enclosures, poles, boxes, etc.

3.8 PAINTING OF EQUIPMENT:

A. Factory Applied: Electrical equipment shall have factory applied painting system which shall, as a minimum, meet the requirements of NEMA ICS 6 corrosion-resistance test and the additional requirements specified in the technical section.

B. Field Applied: Paint electrical equipment as required to match finish of adjacent surfaces.

3.9 RECORDS:

A. Maintain one copy of the contract Drawing Sheets on the site of the work for recording the "as built" condition. Maintain up to date record set of electrical prints during the course of construction. Drawings shall be subject to the inspection by the State's Representative at all times. After completion of the work, the Contractor shall carefully mark the work as actually constructed, revising, deleting and adding to the Drawing Sheets as required. The following requirements shall be complied with:

1. Cable Size and Type: Provide the size and type of each cable installed on project.
2. Substructure: Where the location of all underground conduits, pull boxes, stub ups and etc. where are found to be different than shown, carefully mark the correct location on the Drawings. Work shall be dimensioned from existing improvements.
3. Size of all conduit runs.
4. Routes of concealed conduit runs and conduit runs below grade.
5. Homerun points of all branch circuit.
6. Location of all switchgear, panels, MCC, lighting control panels, pullcans, etc.
7. Changes made as a result of all approved change orders, addendums, or field authorized revisions.
8. As Builts: At the completion of the Work the Contractor shall review, certify, correct and turn over the marked up Drawings to the State's Representative for his use in preparing "as built" plans.
9. As built Drawings shall be delivered to the State's Representative within ten (10) days of completion of construction.

3.10 OPERATING AND MAINTENANCE INSTRUCTIONS

A. At time of completion, the contractor shall provide a period of not less than 6 hours training for instruction of operation and maintenance personnel in the use of systems. Instruct all personnel at one time in one session. Make necessary arrangements with manufacturer's representative. Provide product literature and application guides for user's reference during instruction.

B. Operations and Maintenance Manuals

1. Provide operation and maintenance manuals per specifications as described in SUBMITTALS in this section with the following additional requirements:

a. A comprehensive index.

b. A complete "Record" set of favorably reviewed electrical submittals as provided under section SUBMITTALS illustrating all components, piping, and electrical connections.

c. A complete list of the equipment supplied, including serial numbers, ranges, catalog cuts, and pertinent data.

d. Full specification on each item.

e. Detailed service, maintenance and operation instructions for each item supplied. Schematic diagrams of all electronic devices shall be included. A complete parts list with stock numbers shall be provided for the components that make up the assembly. All of these shall be originals, no copies.

f. Special maintenance requirements particular to this system shall be clearly defined, along with special calibration and test procedures.

2. Submit electronic readable PDF file format (CD disk copies (2) or email attachments) of the proposed O&M manuals for review by the State's Representative. Submittals shall be delivered timely to the State's Representative to allow for review period, corrections, and re-submissions as necessary

a. General contractor supervision must not be circumvented by sending submittals direct to State's Representative.

b. O&M submittals shall be published 1st electronically and 2nd on hard copy paper stock.

c. Electronic submittals shall be transmitted with the hard copy submittals and be viewable using a PDF reader.

d. Electronic submittals shall be assembled in accordance with the specifications for hard copy submittals with table of contents,

bookmarks, tabs, subtabs, etc. utilizing the electronic bookmarks feature available in the PDF assembler.

e. Electronic (PDF) submittals must follow all applicable requirements for hard copy submittals including indexing, item selection indication, bookmarks, etc.

3. Provide four (4) hard copy O&M manuals per specifications as described in SUBMITTALS in this section.

a. Deliver approved hard-copy O&M manuals to the project site and State prior to pre-operational testing or equipment start-up

C. At the end of the project, hard copy and soft copy electronic PDF files, shall be updated to “as-built” conditions.

D. Provide two (2) sets of compact disk (CD) containing all drawings, programs, documents or other computer electronic files prepared for this project in native file format and updated to reflect as-built conditions.

3.11 CLEAN UP:

A. Upon completion of electrical work, remove all surplus materials, rubbish, and debris that accumulated during the construction work. Leave the entire area neat, clean, and acceptable to the State’s Representative.

3.12 PROJECT CLOSEOUT

A. Coordinate with the requirements of Division 01.

B. Special tools or safety equipment: Provide one of each tool or piece of safety equipment required for proper operation and maintenance of equipment installed under this work. Coordinate equipment required with equipment manufacturer and facility engineer/representative.

C. Keying: Provide two keys for each lock furnished under this work.

END OF SECTION 260010

SECTION 260519

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire rated 600 V or less.
2. Connectors, splices, and terminations rated 600 V and less.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Manufacturers: Available manufacturers subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

1. American Insulated Wire Corp.; A Leviton Company
2. General Cable Corporation
3. Okonite
4. Southwire Company
5. AFC
6. Alcan
7. CME
8. Encore
9. Or equal

C. Standards:

1. Listed and labeled as defined in the CEC, by a qualified testing agency, and marked for intended location and use.
2. RoHS compliant.
3. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

D. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 or stranded conductors.

E. Conductor Insulation:
1. Type RHH and Type RHW-2: Comply with UL 44.
2. Type USE-2 and Type SE: Comply with UL 854.
3. Type THHN and Type THWN-2: Comply with UL 83.
4. Type XHHW-2: Comply with UL 44.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Manufacturers: Available manufacturers subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.
1. AFC cable systems, Inc
2. AMP incorporated/Tyco International
3. Hubbell/Anderson
4. O-Z/Gedney; EGS Electrical Group LLC
5. 3M Company; Electrical Products Division
6. Burndy
7. Thomas & Betts
8. Or equal

C. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

D. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper.
2. Type: Two hole with long barrels.
3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Feeders: Copper; solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

B. Branch Circuits: Copper. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Feeders: Type THHN/THWN-2, single conductors in raceway.

B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

D. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

C. 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.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. 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.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

END OF SECTION 260519

SECTION 260526

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes grounding and bonding systems and equipment.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article.

B. Qualification Data: For testing agency and testing agency's field supervisor.

C. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1. Plans showing as-built, dimensioned locations of system described in "Field Quality Control" Article, including the following:

    a. Test wells.
    b. Ground rods.

2. Instructions for periodic testing and inspection of grounding features at test wells based on NETA MTS and NFPA 70B.

    a. Tests shall determine if ground-resistance or impedance values remain within specified maximums, and instructions shall recommend corrective action if values do not.
    b. Include recommended testing intervals.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Certified by NETA.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the CEC, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Burndy; Part of Hubbell Electrical Systems
2. Erico International Corporation
3. Ilsco
4. O-Z/Gedney; an EGS electrical group brand
5. Thomas & Betts Corporation
6. Blackburn
7. Or equal

2.3 CONDUCTORS

A. Insulated Conductors: Copper or tinned-copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

1. Solid Conductors: ASTM B3.
2. Stranded Conductors: ASTM B8.
3. Tinned Conductors: ASTM B33.
4. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
5. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
6. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
7. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.

B. Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

C. Bus-Bar Connectors: Compression type, copper or copper alloy, with two wire terminals.

D. Beam Clamps: Mechanical type, terminal, ground wire access from four directions, with dual, tin-plated or silicon bronze bolts.

E. Cable-to-Cable Connectors: Compression type, copper or copper alloy.

F. Conduit Hubs: Mechanical type, terminal with threaded hub.

G. Ground Rod Clamps: Mechanical type, copper or copper alloy, terminal with hex head bolt.

H. Lay-in Lug Connector: Mechanical type, copper rated for direct burial terminal with set screw.

I. Service Post Connectors: Mechanical type, bronze alloy terminal, in short- and long-stud lengths, capable of single and double conductor connections.

J. Straps: Solid copper, copper lugs. Rated for 600 A.

K. U-Bolt Clamps: Mechanical type, copper or copper alloy, terminal listed for direct burial.

L. Water Pipe Clamps:

1. Mechanical type, two pieces with stainless-steel bolts.

    a. Material: Tin-plated aluminum.
    b. Listed for direct burial.

2. U-bolt type with malleable-iron clamp and copper ground connector rated for direct burial.

2.5 GROUNDING ELECTRODES

A. Ground Rods: Copper-clad steel 3/4 inch by 10 feet.

B. Ground Plates: 1/4 inch thick, hot-dip galvanized.

PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger unless otherwise indicated.

B. Underground Grounding Conductors: Install bare tinned-copper conductor, No. 2/0 AWG minimum.

1. Bury at least 30 inches below grade.

C. 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.

3.2 GROUNDING AT THE SERVICE

A. Equipment grounding conductors and grounding electrode conductors shall be connected to the ground bus. Install a main bonding jumper between the neutral and ground buses.

3.3 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 inches will extend above finished floor. If necessary, install ground rod before manhole is placed and provide No. 1/0 AWG bare, tinned-copper conductor from ground rod into manhole through a waterproof 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 inches above to 6 inches below concrete. Seal floor opening with waterproof, nonshrink grout.

C. Pad-Mounted Transformers and Switches: Install two ground rods and ground ring around the pad. Ground pad-mounted equipment and noncurrent-carrying metal items associated with substations by connecting them to underground cable and grounding electrodes. Install tinned-copper conductor not less than No. 2 AWG for ground ring and for taps to equipment grounding terminals. Bury ground ring not less than 6 inches from the foundation.

3.4 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

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. Armored and metal-clad cable runs.
8. Busway Supply Circuits: Install insulated equipment grounding conductor from grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

C. 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.

3.5 INSTALLATION

A. 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.

B. Ground Rods: Drive rods until tops are 2 inches 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.

C. 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 bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

D. 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; use a bolted clamp connector or bolt a lug-type connector to a pipe flange by 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.
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.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.
3. 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.

    a. Measure ground resistance no fewer than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance.
    b. Perform tests by fall-of-potential method according to IEEE 81.

4. Prepare dimensioned Drawings locating each test well, ground rod and ground-rod assembly, and other grounding electrodes. Identify each by letter in alphabetical order, and key to the record of tests and observations. Include the number of rods driven and their depth at each location, and include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 10 ohms.
2. Power and Lighting Equipment or System with Capacity of 500 to 1000 kVA: 5 ohms.
3. handhole Grounds: 10 ohms.

F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify State's Representative promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526

SECTION 260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel slotted support systems.
2. Conduit and cable support devices.
3. Support for conductors in vertical conduit.
4. Structural steel for fabricated supports and restraints.
5. Mounting, anchoring, and attachment components, including powder-actuated fasteners, mechanical expansion anchors, concrete inserts, clamps, through bolts, toggle bolts, and hanger rods.
6. Fabricated metal equipment support assemblies.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For fabrication and installation details for electrical hangers and support systems.

1. Hangers. Include product data for components.
2. Slotted support systems.
3. Equipment supports.
4. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

C. Delegated-Design Submittal: For hangers and supports for electrical systems.

1. Include design calculations and details of hangers.
2. Include design calculations for seismic restraints.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Reflected ceiling plan(s) and other details, drawn to scale, and coordinated with each other, using input from installers of the items involved.

B. Seismic Qualification Data: Certificates, for hangers and supports for electrical equipment and systems, accessories, and components, from manufacturer.

C. Welding certificates.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M.
2. AWS D1.2/D1.2M.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design hanger and support system.

B. Seismic Performance: Hangers and supports shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the supported equipment and systems will remain in place without separation of any parts when subjected to the seismic forces specified."
2. Component Importance Factor: 1.0.

C. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1. Flame Rating: Class 1.
2. Self-extinguishing according to ASTM D635.

2.2 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Preformed steel channels and angles with minimum 13/32-inch-diameter holes at a maximum of 8 inches o.c. in at least one surface.

1. Manufacturers:

a. Cooper B-Line
b. Erico International
c. Unistrut
d. Thomas & Betts
e. Or equal

2. Standard: Comply with MFMA-4 factory-fabricated components for field assembly.
3. Material for Channel, Fittings, and Accessories: Galvanized steel.
4. Channel Width: Selected for applicable load criteria.

5. Metallic Coatings: Hot-dip galvanized after fabrication and applied according to MFMA-4.
6. Nonmetallic Coatings: Manufacturer's standard PVC, polyurethane, or polyester coating applied according to MFMA-4.
7. Painted Coatings: Manufacturer's standard painted coating applied according to MFMA-4.
8. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for nonarmored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be made of malleable iron.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A36/A36M steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:

1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

    a. Hilti Inc.
    b. ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
    c. MKT Fastening, LLC
    d. Simpson Strong-Tie Co., Masterset Fastening System Unit

2. Mechanical-Expansion Anchors: Insert-wedge-type, stainless steel, for use in hardened portland cement concrete, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.

    a. Available Manufacturers: Subject to compliance with the requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

        1) Cooper B-Line; Inc., a division of Cooper Industries
        2) ITW Ramset/Red Head; a division of Illinois Tool Works, Inc.
        3) Empire Tool and Manufacturing Co., Inc.
        4) MKT Fastening, LLC.
        5) Or equal

3. Concrete Inserts: Steel or malleable-iron, slotted support system units are similar to MSS Type 18 units and comply with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58 units are suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM F3125/F3125M, Grade A325.
6. Toggle Bolts: Stainless-steel springhead type.
7. Hanger Rods: Threaded steel.

2.3 FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES

A. Description: Welded or bolted structural-steel shapes, shop or field fabricated to fit dimensions of supported equipment.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with the following standards for application and installation requirements of hangers and supports, except where requirements on Drawings or in this Section are stricter:

1. NECA 1.
2. NECA 101
3. NECA 102.
4. NECA 105.
5. NECA 111.

B. Comply with requirements for raceways and boxes specified in Section 260533 "Raceways and Boxes for Electrical Systems."

C. Maximum Support Spacing and Minimum Hanger Rod Size for Raceways: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings, and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT and RMC may be supported by openings through structure members, according to NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick.
6. To Steel: Beam clamps (MSS SP-58, Type 19, 21, 23, 25, or 27), complying with MSS SP-69.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that comply with seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid the need for reinforcing bars.

3.3 INSTALLATION OF FABRICATED METAL SUPPORTS

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS D1.1/D1.1M.

END OF SECTION 260529

SECTION 260533

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits and fittings.
2. Metal wireways and auxiliary gutters.
3. Surface raceways.
4. Boxes, enclosures, and cabinets.

B. Related Requirements:

1. Section 260543 "Underground Ducts and Raceways for Electrical Systems" for exterior ductbanks, manholes, and underground utility construction.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: For custom enclosures and cabinets. Include plans, elevations, sections, and attachment details.

1.3 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Conduit routing plans, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of items involved:

1. Structural members in paths of conduit groups with common supports.
2. HVAC and plumbing items and Architectural features in paths of conduit groups with common supports.

B. Seismic Qualification Data: Certificates, for enclosures, cabinets, and conduit racks and their mounting provisions, including those for internal components, from manufacturer.

PART 2 - PRODUCTS

2.1 METAL CONDUITS AND FITTINGS

A. Metal Conduit:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

    a. Allied Tubing & Conduit
    b. Picoma Industries
    c. Republic Conduit
    d. Western Tube and Conduit Corporation
    e. Wheatland Tube Company
    f. Or equal

2. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in the CEC, by a qualified testing agency, and marked for intended location and application.
3. GRC: Comply with ANSI C80.1 and UL 6.
4. ARC: Comply with ANSI C80.5 and UL 6A.
5. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.

    a. Comply with NEMA RN 1.
    b. Coating Thickness: 0.040 inch, minimum.

6. EMT: Comply with ANSI C80.3 and UL 797.
7. FMC: Comply with UL 1; zinc-coated steel.
8. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.

B. Metal Fittings: Comply with NEMA FB 1 and UL 514B.

1. Listing and Labeling: Listed and labeled as defined in the CEC, by a qualified testing agency, and marked for intended location and application.
2. Fittings, General: Listed and labeled for type of conduit, location, and use.
3. Conduit Fittings for Hazardous (Classified) Locations: Comply with UL 1203 and NFPA 70.
4. Fittings for EMT:

    a. Material: Steel.
    b. Type: Setscrew or compression.

5. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.
6. Coating for Fittings for PVC-Coated Conduit: Minimum thickness of 0.040 inch, with overlapping sleeves protecting threaded joints.

C. Joint Compound for IMC, GRC, or ARC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

2.2 METAL WIREWAYS AND AUXILIARY GUTTERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cooper B-Line Inc.; a division of Cooper Industries
2. Hoffman; a brand of Pentair Equipment Protection
3. Or equal

B. Description: Sheet metal, complying with UL 870 and NEMA 250, Type 1 or Type 3R unless otherwise indicated, and sized according to NFPA 70.

1. Metal wireways installed outdoors shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Fittings and Accessories: Include covers, couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.

2.3 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Cooper Technologies Company
2. EGS/Appleton Electric
3. Erickson Electric Equipment Company
4. Hoffman; a brand of Pentair Equipment Protection
5. Hubbell Incorporated
6. Kraloy
7. Milbank Manufacturing Co.
8. Oldcastle Enclosure Solutions
9. O-Z/Gedney; an EGS Electrical Group Brand
10. RACO; Hubbell
11. Robroy Industries
12. Wiremold/Legrand
13. Or equal

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, aluminum, Type FD, with gasketed cover.

E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, cast aluminum with gasketed cover.

H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

I. Device Box Dimensions: 4 inches square by 2-1/8 inches deep.

J. Gangable boxes are prohibited.

K. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 3R with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic.
3. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

L. Cabinets:

1. NEMA 250, Type 1 or Type 3R galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Outdoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed Conduit: GRC.
2. Concealed Conduit, Aboveground: GRC.
3. Underground Conduit: RNC, Type EPC-40-PVC.

4. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
5. Boxes and Enclosures, Aboveground: NEMA 250, Type 3R.

B. Indoors: Apply raceway products as specified below unless otherwise indicated.

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC. Raceway locations include the following:

    a. Loading dock.
    b. Corridors used for traffic of mechanized carts, forklifts, and pallet-handling units.
    c. Mechanical rooms.
    d. Gymnasiums.

4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens and damp or wet locations.

C. Minimum Raceway Size: 1/2-inch trade size.

D. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.
3. EMT: Use setscrew or compression, steel fittings. Comply with NEMA FB 2.10.
4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

E. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

F. Install surface raceways only where indicated on Drawings.

G. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

3.2 INSTALLATION

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

B. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

C. Do not install raceways or electrical items on any "explosion-relief" walls or rotating equipment.

D. Do not fasten conduits onto the bottom side of a metal deck roof.

E. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

F. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

G. Arrange stub-ups so curved portions of bends are not visible above finished slab.

H. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

I. Make bends in raceway using large-radius preformed ells. Field bending shall be according to NFPA 70 minimum radii requirements. Use only equipment specifically designed for material and size involved.

J. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

K. Support conduit within 12 inches of enclosures to which attached.

L. Raceways Embedded in Slabs:

1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
4. Do not embed threadless fittings in concrete unless specifically approved by State’s Representative for each specific location.
5. Change from ENT to GRC before rising above floor.

M. Stub-ups to Above Recessed Ceilings:

1. Use EMT or RMC for raceways.
2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

N. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

O. Coat field-cut threads on PVC-coated raceway with a corrosion-preventing conductive compound prior to assembly.

P. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

Q. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on 1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

R. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

S. Surface Raceways:

1. Install surface raceway with a minimum 2-inch radius control at bend points.
2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section. Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

T. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces.

U. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground service raceway enters a building or structure.

3. Conduit extending from interior to exterior of building.
4. Conduit extending into pressurized duct and equipment.
5. Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6. Where otherwise required by NFPA 70.

V. Expansion-Joint Fittings:

1. Install in each run of aboveground RNC that is located where environmental temperature change may exceed 30 deg F and that has straight-run length that exceeds 25 feet.
2. Install type and quantity of fittings that accommodate temperature change listed for each of the following locations:

    a. Outdoor Locations Not Exposed to Direct Sunlight: 125 deg F temperature change.
    b. Outdoor Locations Exposed to Direct Sunlight: 155 deg F temperature change.
    c. Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.
    d. Attics: 135 deg F temperature change.

3. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per degree F of temperature change for PVC conduits.
4. Install expansion fittings at all locations where conduits cross building or structure expansion joints.
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. Install conduit supports to allow for expansion movement.

W. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 36 inches of flexible conduit for recessed and semirecessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

X. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to center of box unless otherwise indicated.

Y. 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. Prepare block surfaces to provide a flat surface for a raintight connection between the box and cover plate or the supported equipment and box.

Z. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

AA. Locate boxes so that cover or plate will not span different building finishes.

BB. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

CC. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.4 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533

SECTION 260543

UNDERGROUND DUCTS AND RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits and fittings, including GRC and PVC-coated steel conduit.
2. Rigid nonmetallic duct.
3. Flexible nonmetallic duct.
4. Duct accessories.
5. Precast concrete handholes.

1.2 DEFINITIONS

A. Direct Buried: Duct or a duct bank that is buried in the ground, without any additional casing materials such as concrete.

B. Duct: A single duct or multiple ducts. Duct may be either installed singly or as component of a duct bank.

C. Duct Bank:

1. Two or more ducts installed in parallel, with or without additional casing materials.
2. Multiple duct banks.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings:

1. Factory-Fabricated Handholes and Boxes Other Than Precast Concrete:

a. Include dimensioned plans, sections, and elevations, and fabrication and installation details.
b. Include duct entry provisions, including locations and duct sizes.
c. Include cover design.
d. Include grounding details.
e. Include dimensioned locations of cable rack inserts, and pulling-in and lifting irons.

1.4 INFORMATIONAL SUBMITTALS

A. Product Certificates: For concrete and steel used in precast concrete handholes, as required by ASTM C858.

B. Source quality-control reports.

C. Field quality-control reports.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM E329 for testing indicated.

PART 2 - PRODUCTS

2.1 METAL CONDUIT AND FITTINGS

A. GRC: Comply with ANSI C80.1 and UL 6.

B. Coated Steel Conduit: PVC-coated GRC.

1. Comply with NEMA RN 1.
2. Coating Thickness: 0.040 inch, minimum.

C. Listed and labeled as defined in the CEC, by a nationally recognized testing laboratory, and marked for intended location and application.

2.2 RIGID NONMETALLIC DUCT

A. Underground Plastic Utilities Duct: Type EPC-80-PVC and Type EPC-40-PVC RNC, complying with NEMA TC 2 and UL 651, with matching fittings complying with NEMA TC 3 by same manufacturer as duct.

B. Listed and labeled as defined in the CEC, by a nationally recognized testing laboratory, and marked for intended location and application.

2.3 DUCT ACCESSORIES

A. Underground-Line Warning Tape: Comply with requirements for underground-line warning tape specified in Section 260553 "Identification for Electrical Systems."

2.4 PRECAST CONCRETE HANDHOLES AND BOXES

A. Description: Factory-fabricated, reinforced-concrete, monolithically poured walls and bottom unless open-bottom enclosures are indicated. Frame and cover shall form top of enclosure and shall have load rating consistent with that of handhole or box.

B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Christy Concrete Products
   2. Elmhurst-Chicago Stone Co.
   3. Oldcastle Precast Group
   4. Rinker Group, Ltd.
   5. Riverton Concrete Products
   6. Utility Concrete Products, LLC.
   7. Utility Vault Co.
   8. Or equal

C. Comply with ASTM C858 for design and manufacturing processes.

D. Frame and Cover: Weatherproof steel frame, with steel cover with recessed cover hook eyes and tamper-resistant, captive, cover-securing bolts.

E. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.

F. Cover Legend: Molded lettering, "ELECTRIC." or as indicated for each service.

G. Configuration: Units shall be designed for flush burial and have open bottom unless otherwise indicated.

H. Extensions and Slabs: Designed to mate with bottom of enclosure. Same material as enclosure.

   1. Extension shall provide increased depth of 12 inches.
   2. Slab: Same dimensions as bottom of enclosure, and arranged to provide closure.

I. Joint Sealant: Asphaltic-butyl material with adhesion, cohesion, flexibility, and durability properties necessary to withstand maximum hydrostatic pressures at the installation location with the ground-water level at grade.

J. Knockout Panels: Precast openings in walls, arranged to match dimensions and elevations of approaching duct, plus an additional 12 inches vertically and horizontally to accommodate alignment variations.

K. Duct Entrances in Handhole Walls: Cast end-bell or duct-terminating fitting in wall for each entering duct.

L. Handholes 12 inches wide by 24 inches long and larger shall have inserts for cable racks and pulling-in irons installed before concrete is poured.

2.5 SOURCE QUALITY CONTROL

A. Test and inspect precast concrete utility structures according to ASTM C1037.

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate layout and installation of duct, duct bank, manholes, handholes, and boxes with final arrangement of other utilities, site grading, and surface features as determined in the field. Notify State's Representative if there is a conflict between areas of excavation and existing structures or archaeological sites to remain.

B. Coordinate elevations of duct and duct-bank entrances into manholes, handholes, and boxes with final locations and profiles of duct and duct banks, as determined by coordination with other utilities, underground obstructions, and surface features. Revise locations and elevations as required to suit field conditions and to ensure that duct and duct bank will drain to manholes and handholes, and as approved by State's Representative.

3.2 UNDERGROUND DUCT APPLICATION

A. Duct for Electrical Feeders 600 V and Less: RNC Type EPC-40-PVC, direct-buried unless otherwise indicated.

B. Duct for Electrical Branch Circuits: RNC Type EPC-40-PVC, direct-buried unless otherwise indicated.

C. Underground Ducts Crossing Paved Paths, Walks, and Driveways and Roadways: RNC Type EPC-40 PVC, encased in reinforced concrete.

D. Stub-ups: Concrete-encased GRC.

3.3 UNDERGROUND ENCLOSURE APPLICATION

A. Handholes and Boxes for 600 V and Less:

1. Units in Roadways and Other Deliberate Traffic Paths: Precast concrete. AASHTO HB 17, H-20 structural load rating.
2. Units in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nondeliberate Loading by Heavy Vehicles: Precast concrete, AASHTO HB 17, H-20 structural load rating.
3. Units in Sidewalk and Similar Applications with a Safety Factor for Nondeliberate Loading by Vehicles: Precast concrete, AASHTO HB 17, H-10 structural load rating.

4. Cover design load shall not exceed the design load of the handhole or box.

3.4 EARTHWORK

A. Excavation and Backfill: Comply with Section 312000 "Earth Moving," but do not use heavy-duty, hydraulic-operated, compaction equipment.

B. Restoration: Replace area immediately after backfilling is completed or after construction vehicle traffic in immediate area is complete.

C. Restore surface features at areas disturbed by excavation, and re-establish original grades unless otherwise indicated. Replace removed sod immediately after backfilling is completed.

D. Restore areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Section 329200 "Turf and Grasses" and Section 329300 "Plants."

E. Cut and patch existing pavement in the path of underground duct, duct bank, and underground structures according to "Cutting and Patching" Article in Section 017300 "Execution."

3.5 DUCT AND DUCT-BANK INSTALLATION

A. Where indicated on Drawings, install duct, spacers, and accessories into the duct-bank configuration shown. Duct installation requirements in this Section also apply to duct bank.

B. Install duct according to NEMA TCB 2.

C. Slope: Pitch duct a minimum slope of 1:300 down toward manholes and handholes and away from buildings and equipment. Slope duct from a high point between two manholes, to drain in both directions.

D. Curves and Bends: Use 5-degree angle couplings for small changes in direction. Use manufactured long sweep bends with a minimum radius of 48 inches, both horizontally and vertically, at other locations unless otherwise indicated.

1. Duct shall have maximum of two 90 degree bends or the total of all bends shall be no more 180 degrees between pull points.

E. Joints: Use solvent-cemented joints in duct and fittings and make watertight according to manufacturer's written instructions. Stagger couplings so those of adjacent duct do not lie in same plane.

F. Installation Adjacent to High-Temperature Steam Lines: Where duct is installed parallel to underground steam lines, perform calculations showing the duct will not be subject to environmental temperatures above 40 deg C. Where environmental temperatures are calculated to rise above 40 deg C, and anywhere the duct crosses above an underground steam line, install insulation blankets listed for direct burial to isolate the duct bank from the steam line.

G. End Bell Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use end bells, spaced approximately 10 inches o.c. for 5-inch duct, and vary proportionately for other duct sizes.

H. Terminator Entrances to Manholes and Concrete and Polymer Concrete Handholes: Use manufactured, cast-in-place duct terminators, with entrances into structure spaced approximately 6 inches o.c. for 4-inch duct, and vary proportionately for other duct sizes.

I. Building Wall Penetrations: Make a transition from underground duct to GRC at least 10 feet outside the building wall, without reducing duct line slope away from the building and without forming a trap in the line. Use fittings manufactured for RNC-to-GRC transition. Install GRC penetrations of building walls as specified in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

J. Sealing: Provide temporary closure at terminations of duct with pulled cables. Seal spare duct at terminations. Use sealing compound and plugs to withstand at least 15-psig hydrostatic pressure.

K. Pulling Cord: Install 200-lbf-test nylon cord in empty ducts.

L. Direct-Buried Duct and Duct Bank:

1. Excavate trench bottom to provide firm and uniform support for duct. Comply with requirements in Section 312000 "Earth Moving" for preparation of trench bottoms for pipes less than 6 inches in nominal diameter.
2. Width: Excavate trench 3 inches wider than duct on each side.
3. Depth: Install top of duct at least 36 inches below finished grade unless otherwise indicated.
4. Set elevation of bottom of duct bank below frost line.
5. Support ducts on duct spacers coordinated with duct size, duct spacing, and outdoor temperature.
6. Spacer Installation: Place spacers close enough to prevent sagging and deforming of duct, with not less than four spacers per 20 feet of duct. Place spacers within 24 inches of duct ends. Stagger spacers approximately 6 inches between tiers. Secure spacers to earth and to ducts to prevent floating during concreting. Tie entire assembly together using fabric straps; do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.
7. Install duct with a minimum of 3 inches between ducts for like services and 12 inches between power and communications duct.

8. Install manufactured GRC elbows for stub-ups, at building entrances, and at changes of direction in duct.
9. After installing first tier of duct, backfill and compact. Start at tie-in point and work toward end of duct run, leaving ducts at end of run free to move with expansion and contraction as temperature changes during this process. Repeat procedure after placing each tier. After placing last tier, hand place backfill to 4 inches over duct and hand tamp. Firmly tamp backfill around ducts to provide maximum supporting strength. Use hand tamper only. After placing controlled backfill over final tier, make final duct connections at end of run and complete backfilling with normal compaction. Comply with requirements in Section 312000 "Earth Moving" for installation of backfill materials.

    a. Place minimum 3 inches of sand as a bed for duct. Place sand to a minimum of 6 inches above top level of duct.
    b. Place minimum 6 inches of engineered fill above concrete encasement of duct.

M. Underground-Line Warning Tape: Bury conducting underground line specified in Section 260553 "Identification for Electrical Systems" no less than 12 inches above all concrete-encased duct and duct banks and approximately 12 inches below grade. Align tape parallel to and within 3 inches of centerline of duct bank. Provide an additional warning tape for each 12-inch increment of duct-bank width over a nominal 18 inches. Space additional tapes 12 inches apart, horizontally.

3.6 INSTALLATION OF CONCRETE MANHOLES, HANDHOLES, AND BOXES

A. Precast Concrete Handhole and Manhole Installation:

1. Comply with ASTM C891 unless otherwise indicated.
2. Install units level and plumb and with orientation and depth coordinated with connecting duct, to minimize bends and deflections required for proper entrances.
3. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 1-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.

B. Elevations:

1. Install handholes with bottom below frost line.
2. Handhole Covers: In paved areas and trafficways, set surface flush with finished grade. Set covers of other handholes 1 inch above finished grade.
3. Where indicated, cast handhole cover frame integrally with handhole structure.

C. Waterproofing: Apply waterproofing to exterior surfaces of handholes after concrete has cured at least three days. After duct has been connected and grouted, and before backfilling, waterproof joints and connections, and touch up

abrasions and scars. Waterproof exterior of manhole chimneys after mortar has cured at least three days.

D. Hardware: Install removable hardware, including pulling eyes, cable stanchions, and cable arms, and insulators, as required for installation and support of cables and conductors and as indicated.

E. Field-Installed Bolting Anchors in Manholes and Concrete Handholes: Do not drill deeper than 3-7/8 inches for manholes and 2 inches for handholes, for anchor bolts installed in the field. Use a minimum of two anchors for each cable stanchion.

3.7 GROUNDING

A. Ground underground ducts and utility structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Demonstrate capability and compliance with requirements on completion of installation of underground duct, duct bank, and utility structures.
2. Pull solid aluminum or wood test mandrel through duct to prove joint integrity and adequate bend radii, and test for out-of-round duct. Provide a minimum 12-inch-long mandrel equal to duct size minus 1/4 inch. If obstructions are indicated, remove obstructions and retest.
3. Test handhole grounding to ensure electrical continuity of grounding and bonding connections. Measure and report ground resistance as specified in Section 260526 "Grounding and Bonding for Electrical Systems."

B. Correct deficiencies and retest as specified above to demonstrate compliance.

C. Prepare test and inspection reports.

3.9 CLEANING

A. Pull leather-washer-type duct cleaner, with graduated washer sizes, through full length of duct until duct cleaner indicates that duct is clear of dirt and debris. Follow with rubber duct swab for final cleaning and to assist in spreading lubricant throughout ducts.

END OF SECTION 260543

SECTION 260553

IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Color and legend requirements for raceways, conductors, and warning labels and signs.
2. Labels.
3. Tapes and stencils.
4. Tags.
5. Signs.
6. Cable ties.
7. Paint for identification.
8. Fasteners for labels and signs.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Comply with ASME A13.1 and IEEE C2.

B. Comply with CEC.

C. Comply with 29 CFR 1910.144 and 29 CFR 1910.145.

D. Comply with ANSI Z535.4 for safety signs and labels.

E. Comply with NFPA 70E requirements for arc-flash warning labels.

F. Adhesive-attached labeling materials, including label stocks, laminating adhesives, and inks used by label printers, shall comply with UL 969.

G. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COLOR AND LEGEND REQUIREMENTS

A. Raceways and Cables Carrying Circuits at 600 V or Less:

1. Black letters on an orange field.
2. Legend: Indicate voltage.

B. 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. Color shall be factory applied or field applied for sizes larger than No. 8 AWG if authorities having jurisdiction permit.
2. Colors for 208/120-V Circuits:

a. Phase A: Black.
b. Phase B: Red.
c. Phase C: Blue.

3. Colors for 240-V Circuits:

a. Phase A: Black.
b. Phase B: Red.

4. Colors for 480/277-V Circuits:

a. Phase A: Brown.
b. Phase B: Orange.
c. Phase C: Yellow.

5. Color for Neutral: White.
6. Color for Equipment Grounds: Green.
7. Colors for Isolated Grounds: Green two or more yellow stripes.

C. Warning Label Colors:

1. Identify system voltage with black letters on an orange background.

D. Warning labels and signs 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."

E. Equipment Identification Labels:

1. Black letters on a white field.

2.3 LABELS

A. Vinyl Wraparound Labels: Preprinted, flexible labels laminated with a clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

B. Self-Adhesive Wraparound Labels: Preprinted, 3-mil-thick, polyester flexible label with acrylic pressure-sensitive adhesive.

1. Self-Lamination: Clear; UV-, weather- and chemical-resistant; self-laminating, protective shield over the legend. Labels sized such that the clear shield overlaps the entire printed legend.
2. Marker for Labels: Permanent, waterproof, black ink marker recommended by tag manufacturer.
3. Marker for Labels: Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

C. Self-Adhesive Labels: Polyester, thermal, transfer-printed, 3-mil-thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Minimum Nominal Size:

a. 1-1/2 by 6 inchesfor raceway and conductors.
b. 3-1/2 by 5 inchesfor equipment.
c. As required by authorities having jurisdiction.

2.4 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mils thick by 1 to 2 inches wide; compounded for outdoor use.

C. Tape and Stencil: 4-inch-wide black stripes on 10-inch centers placed diagonally over orange background and is 12 inches wide. Stop stripes at legends.

D. Underground-Line Warning Tape:

1. Tape:

    a. Recommended by manufacturer for the method of installation and suitable to identify and locate underground electrical and communications utility lines.
    b. Printing on tape shall be permanent and shall not be damaged by burial operations.
    c. Tape material and ink shall be chemically inert and not subject to degradation when exposed to acids, alkalis, and other destructive substances commonly found in soils.

2. Color and Printing:

    a. Comply with ANSI Z535.1, ANSI Z535.2, ANSI Z535.3, ANSI Z535.4, and ANSI Z535.5.
    b. Inscriptions for Red-Colored Tapes: "ELECTRIC LINE, HIGH VOLTAGE".
    c. Inscriptions for Orange-Colored Tapes: "TELEPHONE CABLE, CATV CABLE, COMMUNICATIONS CABLE, OPTICAL FIBER CABLE".

3. Tag:

    a. Detectable three-layer laminate, consisting of a printed pigmented polyolefin film, a solid aluminum-foil core, and a clear protective film that allows inspection of the continuity of the conductive core; bright colored, continuous-printed on one side with the inscription of the utility, compounded for direct-burial service.
    b. Width: 3 inches.
    c. Overall Thickness: 5 mils.
    d. Foil Core Thickness: 0.35 mil.
    e. Weight: 28 lb/1000 sq. ft..
    f. Tensile according to ASTM D882: 70 lbf and 4600 psi.

E. Stenciled Legend: In nonfading, waterproof, black ink or paint. Minimum letter height shall be 1 inch.

2.5 TAGS

A. Write-on Tags:

1. Polyester Tags: 0.010 inch thick, with corrosion-resistant grommet and cable tie for attachment.
2. Marker for Tags: Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.6 SIGNS

A. Baked-Enamel Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 7 by 10 inches.

B. Metal-Backed Butyrate Signs:

1. Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate signs, with 0.0396-inch galvanized-steel backing, punched and drilled for fasteners, and with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal Size: 10 by 14 inches.

C. Laminated Acrylic or Melamine Plastic Signs:

1. Engraved legend.
2. Thickness:

    a. For signs up to 20 sq. in., minimum 1/16 inch thick.
    b. For signs larger than 20 sq. in., 1/8 inch thick.
    c. Engraved legend with white letters on a black background.
    d. Punched or drilled for mechanical fasteners with 1/4-inch grommets in corners for mounting.
    e. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.7 CABLE TIES

A. General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

B. UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 Deg F according to ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

2.8 MISCELLANEOUS IDENTIFICATION PRODUCTS

A. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

B. 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

3.1 INSTALLATION

A. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

B. Install identifying devices before installing acoustical ceilings and similar concealment.

C. Verify identity of each item before installing identification products.

D. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

E. Apply identification devices to surfaces that require finish after completing finish work.

F. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

G. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

H. System Identification for Raceways and Cables under 600 V: Identification shall completely encircle cable or conduit. Place identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

I. System Identification for Raceways and Cables over 600 V: Identification shall completely encircle cable or conduit. Place adjacent identification of two-color markings in contact, side by side.

1. Secure tight to surface of conductor, cable, or raceway.

J. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

K. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from the floor.

L. Vinyl Wraparound Labels:

1. Secure tight to surface at a location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to the location and substrate.

M. Self-Adhesive Wraparound Labels: Secure tight to surface of raceway or cable at a location with high visibility and accessibility.

N. Self-Adhesive Labels:

1. On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and operation and maintenance manual.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.

O. Marker Tapes: Secure tight to surface at a location with high visibility and accessibility.

P. Self-Adhesive Vinyl Tape: Secure tight to surface at a location with high visibility and accessibility.

1. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding.

Q. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.

R. Underground Line Warning Tape:

1. During backfilling of trenches, install continuous underground-line warning tape directly above cable or raceway at 6 to 12 inches below finished grade. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.
2. Install underground-line warning tape for direct-buried cables and cables in raceways.

S. Write-on Tags:

1. Place in a location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

T. Baked-Enamel Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

U. Metal-Backed Butyrate Signs:

1. Attach signs that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

V. Laminated Acrylic or Melamine Plastic Signs:

1. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
2. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on minimum 1-1/2-inch-high sign; where two lines of text are required, use signs minimum 2 inches high.

W. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.2 IDENTIFICATION SCHEDULE

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

C. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits, More Than 30 A and 120 V to Ground: Identify with self-adhesive raceway labels.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

D. Accessible Fittings for Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive

labels containing the wiring system legend and system voltage. System legends shall be as follows:

1. "EMERGENCY POWER."
2. "POWER."

E. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use vinyl wraparound labels to identify the phase.

1. Locate identification at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

F. Conductors to Be Extended in the Future: Attach write-on tags to conductors and list source.

G. Auxiliary Electrical Systems Conductor Identification: Marker tape that is uniform and consistent with system used by manufacturer for factory-installed connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.

H. Locations of Underground Lines: Underground-line warning tape for power, lighting, communication, and control wiring and optical-fiber cable.

I. Instructional Signs: Self-adhesive labels, including the color code for grounded and ungrounded conductors.

J. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive equipment labels.

1. Apply to exterior of door, cover, or other access.
2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:

    a. Power-transfer switches.
    b. Controls with external control power connections.

K. Arc Flash Warning Labeling: Self-adhesive labels.

L. Operating Instruction Signs: Self-adhesive labels.

M. Equipment Identification Labels:

1. Indoor Equipment: Laminated acrylic or melamine plastic sign.
2. Outdoor Equipment: Laminated acrylic or melamine sign.

END OF SECTION 260553

SECTION 262726

WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Specification-grade receptacles, 125 V.
2. GFCI receptacles, 125 V, 20 A.
3. Toggle switches, 120/277 V
4. Occupancy sensors.
5. Wall plates.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: List of legends and description of materials and process used for premarking wall plates.

C. Samples: One for each type of device and wall plate specified, in each color specified.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in the CEC, by a qualified testing agency, and marked for intended location and use.

B. Comply with the CEC.

C. RoHS compliant.

D. Comply with NEMA WD 1.

E. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by State's Representative unless otherwise indicated or required by NFPA 70 or device listing.

F. Wall Plate Color: For plastic covers, match device color.

G. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.

2.2 SPECIFICATION-GRADE RECEPTACLES, 125 V

A. Duplex Receptacles, 125 V:

1. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pass & Seymour/Legrand
    b. Hubbell Incorporated
    c. Leviton Mfg., Company
    d. Cooper Wiring Devices
    e. Or equal

2. Description: Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498 and FS W-C-596.

B. Weather-Resistant Duplex Receptacle, 125 V:

1. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pass & Seymour/Legrand
    b. Hubbell Incorporated
    c. Leviton Mfg., Company Inc.
    d. Cooper Wiring Devices
    e. Or equal

2. Description: Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Standards: Comply with UL 498.
5. Marking: Listed and labeled as complying with NFPA 70, "Receptacles in Damp or Wet Locations" Article.

2.3 GFCI RECEPTACLES, 125 V

A. Duplex GFCI Receptacles, 125 V:

1. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pass & Seymour/Legrand
    b. Hubbell Incorporated
    c. Leviton Mfg., Company Inc.
    d. Cooper Wiring Devices
    e. Or equal.

2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding.
3. Configuration: NEMA WD 6, Configuration 5-20R.
4. Type: Non-feed through.
5. Standards: Comply with UL 498, UL 943 Class A, and FS W-C-596.

B. Tamper- and Weather-Resistant, GFCI Duplex Receptacles, 125 V:

1. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pass & Seymour/Legrand
    b. Hubbell Incorporated
    c. Leviton Mfg., Company Inc.
    d. Cooper Wiring Devices
    e. Or equal

2. Description: Integral GFCI with "Test" and "Reset" buttons and LED indicator light. Two pole, three wire, and self-grounding. Integral shutters that operate only when a plug is inserted in the receptacle. Square face.
3. Configuration: NEMA WD 6, Configuration 5-15R.
4. Type: Non-feed through.
5. Standards: Comply with UL 498 and UL 943 Class A.
6. Marking: Listed and labeled as complying with NFPA 70, "Tamper-Resistant Receptacles" and "Receptacles in Damp or Wet Locations" articles.

2.4 TOGGLE SWITCHES, 120/277 V, 20 A

A. Single-Pole Switches, 120/277 V, 20 A:

1. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Pass & Seymour/Legrand
    b. Hubbell Incorporated
    c. Leviton Mfg., Company Inc.

d. Cooper Wiring Devices
e. Or equal

2. Standards: Comply with UL 20 and FS W-S-896.

2.5 OCCUPANCY SENSORS

A. Wall Switch Sensor Light Switch, Dual Technology:

1. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pass Seymour/Legrand
b. Hubbell Incorporated
c. Leviton Mfg., Company Inc.
d. Cooper Wiring Devices
e. Or equal

2. Description: Switchbox-mounted, combination lighting-control sensor and conventional switch lighting-control unit using dual (ultrasonic and passive infrared) technology.
3. Standards: Comply with UL 20.
4. Rated 960 W at 120 V ac for tungsten lighting, 10 A at 120 V ac or 10 A at 277 V ac for fluorescent or LED lighting, and 1/4 hp at 120 V ac.
5. Adjustable time delay of five, 10, 15, 20 minutes.
6. Able to be locked to Automatic or Manual-On mode.
7. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc.

2.6 DIMMERS

A. Wall-Box Dimmers:

1. Manufacturers: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

a. Pass & Seymour/Legrand
b. Hubbell Incorporated
c. Leviton Mfg., Company Inc.
d. Cooper Wiring Devices
e. Or equal

2. Description: Modular, full-wave, solid-state dimmer switch with integral, quiet on-off switches, with audible frequency and EMI/RFI suppression filters.
3. Control: Continuously adjustable slider; with single-pole or three-way switching.

4. Standards: Comply with UL 1472.
5. LED Lamp Dimmer Switches: Modular; compatible with LED lamps; trim potentiometer to adjust low-end dimming; capable of consistent dimming with low end not greater than 20 percent of full brightness.

2.7 WALL PLATES

A. Single Source: Obtain wall plates from same manufacturer of wiring devices.

B. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces: Steel with white baked enamel, suitable for field painting.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Damp Locations: Thermoplastic with spring-loaded lift cover, and listed and labeled for use in wet and damp locations.

C. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
2. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
3. Install wiring devices after all wall preparation, including painting, is complete.

C. Device Installation:

1. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
2. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

D. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the right.

E. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

F. Dimmers:

1. Install dimmers within terms of their listing.
2. Verify that dimmers used for fan-speed control are listed for that application.
3. Install unshared neutral conductors on line and load side of dimmers according to manufacturers' device, listing conditions in the written instructions.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Tests for Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value of 6 percent or higher is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.

C. Wiring device will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 262726

SECTION 262816

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Nonfusible switches.
2. Molded-case circuit breakers (MCCBs).
3. Molded-case switches.
4. Enclosures.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include nameplate ratings, dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Include time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device. Provide in PDF electronic format.

B. Shop Drawings: For enclosed switches and circuit breakers.

1. Include plans, elevations, sections, details, and attachments to other work.
2. Include wiring diagrams for power, signal, and control wiring.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified testing agency.

B. Seismic Qualification Certificates: For enclosed switches and circuit breakers, accessories, and components, from manufacturer.

C. Field quality-control reports.

1.4 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1.5 QUALITY ASSURANCE

A. Testing Agency Qualifications: Accredited by NETA.

1. Testing Agency's Field Supervisor: Currently certified by NETA to supervise on-site testing.

1.6 WARRANTY

A. Manufacturer's Warranty: Manufacturer and Installer agree to repair or replace components that fail in materials or workmanship within specified warranty period.

1. Warranty Period: One year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Enclosed switches and circuit breakers shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."

2.2 GENERAL REQUIREMENTS

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the CEC, by an NRTL, and marked for intended location and application.

D. Comply with NFPA 70.

2.3 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eaton Electrical Inc.; Cutler Hammer

2. General Electric Company; GE Consumer & Industrial – Electrical Distribution
3. Square D; a brand of Schneider Electric
4. Siemens Energy & Automation, Inc.
5. Or equal

B. Type GD, General Duty, Three Pole, Single Throw, 240-V ac, 600 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

C. Type HD, Heavy Duty, Three Pole, Single Throw, 240-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

D. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.
3. Isolated Ground Kit: Internally mounted; insulated, labeled for copper and aluminum neutral conductors.
4. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.
5. Service-Rated Switches: Labeled for use as service equipment.

2.4 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Eaton Electrical Inc.; Cutler-Hammer
2. General Electric Company; GE Consumer & Industrial – Electrical Distribution
3. Square D; a brand of Schneider Electric
4. Siemens Energy & Automation, Inc.
5. Or equal

B. Circuit breakers shall be constructed using glass-reinforced insulating material. Current carrying components shall be completely isolated from the handle and the accessory mounting area.

C. Circuit breakers shall have a toggle operating mechanism with common tripping of all poles, which provides quick-make, quick-break contact action. The circuit-breaker handle shall be over center, be trip free, and reside in a tripped position between on and off to provide local trip indication. Circuit-breaker escutcheon shall be clearly marked on and off in addition to providing international I/O

markings. Equip circuit breaker with a push-to-trip button, located on the face of the circuit breaker to mechanically operate the circuit-breaker tripping mechanism for maintenance and testing purposes.

D. The maximum ampere rating and UL, IEC, or other certification standards with applicable voltage systems and corresponding interrupting ratings shall be clearly marked on face of circuit breaker. Circuit breakers shall be 100 percent rated combinations for series connected interrupting ratings shall be listed by UL as recognized component combinations. Any series rated combination used shall be marked on the end-use equipment along with the statement "Caution - Series Rated System. _____ Amps Available. Identical Replacement Component Required."

E. MCCBs shall be equipped with a device for locking in the isolated position.

F. Lugs shall be suitable for 140 deg F rated wire on 125-A circuit breakers and below.

G. Standards: Comply with UL 489 with interrupting capacity to comply with available fault currents.

H. Thermal-Magnetic Circuit Breakers: Inverse time-current thermal element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

I. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

J. Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.

2.5 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: UL 489, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

B. Enclosure Finish: The enclosure shall be finished with gray baked enamel paint, electrodeposited on cleaned, phosphatized galvannealed steel (NEMA 250 Types 3R).

C. Conduit Entry: NEMA 250 Types 4, 4X, and 12 enclosures shall contain no knockouts. NEMA 250 Types 7 and 9 enclosures shall be provided with threaded conduit openings in both endwalls.

D. Operating Mechanism: The circuit-breaker operating handle shall be directly operable through the dead front trim of the enclosure (NEMA 250 Type 3R).

The cover interlock mechanism shall have an externally operated override. The override shall not permanently disable the interlock mechanism, which shall return to the locked position once the override is released. The tool used to override the cover interlock mechanism shall not be required to enter the enclosure in order to override the interlock.

E. Enclosures designated as NEMA 250 Type 4, 4X stainless steel, 12, or 12K shall have a dual cover interlock mechanism to prevent unintentional opening of the enclosure cover when the circuit breaker is ON and to prevent turning the circuit breaker ON when the enclosure cover is open.

PART 3 - EXECUTION

3.1 ENCLOSURE ENVIRONMENTAL RATING APPLICATIONS

A. Enclosed Switches and Circuit Breakers: Provide enclosures at installed locations with the following environmental ratings.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R.
3. Wash-Down Areas: NEMA 250, Type 4X, stainless steel.
4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

3.2 INSTALLATION

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by State or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify State’s Representative no fewer than seven days in advance of proposed interruption of electric service.
2. Indicate method of providing temporary electric service.
3. Do not proceed with interruption of electric service without State’s Representative's written permission.
4. Comply with NFPA 70E.

B. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

C. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

D. Temporary Lifting Provisions: Remove temporary lifting of eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

E. Install fuses in fusible devices.

F. Comply with NFPA 70 and NECA 1.

3.3 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections for Switches:

1. Visual and Mechanical Inspection:

a. Inspect physical and mechanical condition.
b. Inspect anchorage, alignment, grounding, and clearances.
c. Verify that the unit is clean.
d. Verify blade alignment, blade penetration, travel stops, and mechanical operation.
e. Verify that fuse sizes and types match the Specifications and Drawings.
f. Verify that each fuse has adequate mechanical support and contact integrity.
g. Inspect bolted electrical connections for high resistance using one of the two following methods:

1) Use a low-resistance ohmmeter.

a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.

2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

h. Verify that operation and sequencing of interlocking systems is as described in the Specifications and shown on the Drawings.
i. Verify correct phase barrier installation.
j. Verify lubrication of moving current-carrying parts and moving and sliding surfaces.

2. Electrical Tests:

a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
b. Measure contact resistance across each switchblade fuseholder. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
c. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with switch closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
d. Measure fuse resistance. Investigate fuse-resistance values that deviate from each other by more than 15 percent.
e. Perform ground fault test according to NETA ATS 7.14 "Ground Fault Protection Systems, Low-Voltage."

C. Tests and Inspections for Molded Case Circuit Breakers:

1. Visual and Mechanical Inspection:

a. Verify that equipment nameplate data are as described in the Specifications and shown on the Drawings.
b. Inspect physical and mechanical condition.
c. Inspect anchorage, alignment, grounding, and clearances.
d. Verify that the unit is clean.
e. Operate the circuit breaker to ensure smooth operation.
f. Inspect bolted electrical connections for high resistance using one of the two following methods:

1) Use a low-resistance ohmmeter.

a) Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from those of similar bolted connections by more than 50 percent of the lowest value.

2) Verify tightness of accessible bolted electrical connections by calibrated torque-wrench method in accordance with manufacturer's published data or NETA ATS Table 100.12.

a) Bolt-torque levels shall be in accordance with manufacturer's published data. In the absence of manufacturer's published data, use NETA ATS Table 100.12.

g. Inspect operating mechanism, contacts, and chutes in unsealed units.
h. Perform adjustments for final protective device settings in accordance with the coordination study.

2. Electrical Tests:

a. Perform resistance measurements through bolted connections with a low-resistance ohmmeter. Compare bolted connection resistance values to values of similar connections. Investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
b. Perform insulation-resistance tests for one minute on each pole, phase-to-phase and phase-to-ground with circuit breaker closed, and across each open pole. Apply voltage in accordance with manufacturer's published data. In the absence of manufacturer's published data, use Table 100.1 from the NETA ATS. Investigate values of insulation resistance less than those published in Table 100.1 or as recommended in manufacturer's published data.
c. Perform a contact/pole resistance test. Drop values shall not exceed the high level of the manufacturer's published data. If manufacturer's published data are not available, investigate values that deviate from adjacent poles or similar switches by more than 50 percent of the lowest value.
d. Perform insulation resistance tests on all control wiring with respect to ground. Applied potential shall be 500-V dc for 300-V rated cable and 1000-V dc for 600-V rated cable. Test duration shall be one minute. For units with solid state components, follow manufacturer's recommendation. Insulation resistance values shall be no less than two megohms.
e. Determine the following by primary current injection:

1) Long-time pickup and delay. Pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's

published time-current characteristic tolerance band, including adjustment factors.

2) Short-time pickup and delay. Short-time pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
3) Ground-fault pickup and time delay. Ground-fault pickup values shall be as specified. Trip characteristics shall not exceed manufacturer's published time-current characteristic tolerance band, including adjustment factors.
4) Instantaneous pickup. Instantaneous pickup values shall be as specified and within manufacturer's published tolerances.

f. Test functionality of the trip unit by means of primary current injection. Pickup values and trip characteristics shall be as specified and within manufacturer's published tolerances.
g. Perform minimum pickup voltage tests on shunt trip and close coils in accordance with manufacturer's published data. Minimum pickup voltage of the shunt trip and close coils shall be as indicated by manufacturer.
h. Verify correct operation of auxiliary features such as trip and pickup indicators; zone interlocking; electrical close and trip operation; trip-free, anti-pump function; and trip unit battery condition. Reset all trip logs and indicators. Investigate units that do not function as designed.
i. Verify operation of charging mechanism. Investigate units that do not function as designed.

3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
4. Test and adjust controls, remote monitoring, and safeties. Replace damaged and malfunctioning controls and equipment.

D. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

1. Test procedures used.
2. Include identification of each enclosed switch and circuit breaker tested and describe test results.
3. List deficiencies detected, remedial action taken, and observations after remedial action.

END OF SECTION 262816

SECTION 265619

LED EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Exterior solid-state luminaires that are designed for and exclusively use LED lamp technology.
2. Luminaire supports.

1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color rendering index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of luminaire.

B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Include diagrams for power, signal, and control wiring.

1.4 INFORMATIONAL SUBMITTALS

A. Coordination Drawings: Plans, drawn to scale and coordinated.

B. Seismic Qualification Data: For luminaires, accessories, and components, from manufacturer.

C. Product Certificates: For each type of the following:

1. Luminaire.

D. Sample warranty.

1.5 CLOSEOUT SUBMITTALS

A. Operation and maintenance data.

1. Provide a list of all lamp types used on Project. Use ANSI and manufacturers' codes.
2. Provide a list of all photoelectric relay types used on Project; use manufacturers' codes.

1.6 FIELD CONDITIONS

A. Mark locations of exterior luminaires for approval by State’s Representative prior to the start of luminaire installation.

1.7 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 2 year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Seismic Performance: Luminaires shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.

B. Seismic Performance: Luminaires and lamps shall be labeled vibration and shock resistant.

1. The term "withstand" means "the luminaire will remain in place without separation of any parts when subjected to the seismic forces specified."

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the CEC, by a qualified testing agency, and marked for intended location and application.

B. NRTL Compliance: Luminaires shall be listed and labeled for indicated class and division of hazard by an NRTL.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. UL Compliance: Comply with UL 1598 and listed for wet location.

E. Lamp base complying with ANSI C81.61 or IEC 60061-1.

F. CRI of minimum 80. CCT of 3000 K.

G. L70 lamp life of 50,000 hours.

H. Lamps dimmable from 100 percent to 0 percent of maximum light output.

I. Nominal Operating Voltage: 120 V ac.

J. Lamp Rating: Lamp marked for outdoor use.

K. Source Limitations: Obtain luminaires from single source from a single manufacturer.

L. Source Limitations: For luminaires, obtain each color, grade, finish, type, and variety of luminaire from single source with resources to provide products of consistent quality in appearance and physical properties.

2.3 LUMINAIRE TYPES

A. As listed in lighting fixture schedule on drawings.

2.4 MATERIALS

A. Metal Parts: Free of burrs and sharp corners and edges.

B. Sheet Metal Components: Corrosion-resistant aluminum. Form and support to prevent warping and sagging.

C. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

D. Diffusers and Globes:

1. Acrylic Diffusers: 100 percent virgin acrylic plastic, with high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
2. Glass: Annealed crystal glass unless otherwise indicated.
3. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.

E. Lens and Refractor Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

F. Reflecting surfaces shall have minimum reflectance as follows unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 83 percent.
3. Diffusing Specular Surfaces: 75 percent.

G. Housings:

1. Rigidly formed, weather- and light-tight enclosure that will not warp, sag, or deform in use.
2. Provide filter/breather for enclosed luminaires.

2.5 FINISHES

A. Variations in Finishes: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

B. Luminaire Finish: Manufacturer's standard paint applied to factory-assembled and -tested luminaire before shipping. Where indicated, match finish process and color of pole or support materials.

C. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Natural Satin Finish: Provide fine, directional, medium satin polish (AA-M32); buff complying with AA-M20 requirements; and seal aluminum surfaces with clear, hard-coat wax.
3. Class I, Clear-Anodic Finish: AA-M32C22A41 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, clear coating 0.018 mm or thicker) complying with AAMA 611.
4. Class I, Color-Anodic Finish: AA-M32C22A42/A44 (Mechanical Finish: Medium satin; Chemical Finish: Etched, medium matte; Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker), complying with AAMA 611.

a. Color: As indicated in schedule.

D. Factory-Applied Finish for Steel Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Surface Preparation: Clean surfaces to comply with SSPC-SP 1, to remove dirt, oil, grease, and other contaminants that could impair paint bond. Grind welds and polish surfaces to a smooth, even finish. Remove mill scale and rust, if present, from uncoated steel, complying with SSPC-SP 5/NACE No. 1 or SSPC-SP 8.
2. Exterior Surfaces: Manufacturer's standard finish consisting of one or more coats of primer and two finish coats of high-gloss, high-build polyurethane enamel.

a. Color: As selected by State’s Representative from manufacturer's full range.

2.6 LUMINAIRE SUPPORT COMPONENTS

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION REQUIREMENTS

A. Comply with NECA 1.

B. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

C. Install lamps in each luminaire.

D. Fasten luminaire to structural support.

E. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Support luminaires without causing deflection of finished surface.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

F. Wall-Mounted Luminaire Support:

1. Attached to a minimum 1/8 inch backing plate attached to wall structural members.

G. Wiring Method: Install cables in raceways. Conceal raceways and cables.

H. Install luminaires level, plumb, and square with finished grade unless otherwise indicated.

I. Coordinate layout and installation of luminaires with other construction.

J. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

K. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" and Section 260533 "Raceways and Boxes for Electrical Systems" for wiring connections and wiring methods.

3.2 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 260533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch-thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.3 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Verify operation of photoelectric controls.

C. Illumination Tests:

1. Measure light intensities at night. Use photometers with calibration referenced to NIST standards. Comply with the following IES testing guide(s):

a. IES LM-5.
b. IES LM-50.
c. IES LM-52.
d. IES LM-64.
e. IES LM-72.

2. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.

D. Luminaire will be considered defective if it does not pass tests and inspections.

E. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

3.5 DEMONSTRATION

A. Train State's maintenance personnel to adjust, operate, and maintain luminaires.

END OF SECTION 265619

SECTION 311000

SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Protecting existing vegetation to remain.
2. Removing existing vegetation.
3. Clearing and grubbing.
4. Stripping and stockpiling topsoil.
5. Removing above- and below-grade site improvements.
6. Disconnecting, capping, or sealing site utilities.
7. Temporary erosion and sedimentation control.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project Site.

1.3 MATERIAL STATESHIP

A. Except for materials indicated to be stockpiled or otherwise remain State's property, cleared materials shall become Contractor's property and shall be removed from Project site.

1.4 FIELD CONDITIONS

A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.

1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from State and authorities having jurisdiction.
2. Provide alternate routes around closed or obstructed trafficways if required by State or authorities having jurisdiction.

B. Salvageable Improvements: Carefully remove items indicated to be salvaged and store on State's premises. Contractor to coordinate with State Parks' Representative on location for salvaged items.

C. Utility Locator Service: Notify utility locator service for area where Project is located before site clearing.

D. Do not commence site clearing operations until temporary erosion- and sedimentation-control, and plant-protection measures are in place.

E. Tree- and Plant-Protection Zones: Protect according to requirements in Section 015639 "Temporary Tree and Plant Protection."

PART 2 - PRODUCTS

2.1 MATERIALS

A. Satisfactory Soil Material: Requirements for satisfactory soil material are specified in Section 312000 "Earth Moving."

1. Obtain approved borrow soil material off-site when satisfactory soil material is not available on-site.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect and maintain benchmarks and survey control points from disturbance during construction.

B. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed according to requirements in Section 015639 "Temporary Tree and Plant Protection."

C. Protect existing site improvements to remain from damage during construction.

1. Restore damaged improvements to their original condition, as acceptable to State.

3.2 TEMPORARY EROSION AND SEDIMENTATION CONTROL

A. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.

B. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

C. Inspect, maintain, and repair erosion- and sedimentation-control measures during construction until permanent vegetation has been established.

D. Remove erosion and sedimentation controls, and restore and stabilize areas disturbed during removal.

3.3 TREE AND PLANT PROTECTION

A. Protect trees and plants remaining on-site according to requirements in Section 015639 "Temporary Tree and Plant Protection."

B. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 RESTORATION

A. Employ a qualified arborist, licensed in jurisdiction where the Project is located, to submit details of proposed repairs and to repair damage to trees and shrubs.

B. Replace trees that can not be repaired and restored to full-growth status, as determined by the State Parks' Representative.

3.5 EXISTING UTILITIES

A. Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place.

1. Arrange with utility companies to shut off indicated utilities.

B. Interrupting Existing Utilities: Do not interrupt utilities serving facilities occupied by State or others, unless permitted under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify State's Representative not less than two days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without State's written permission.

C. Removal of underground utilities is included in earthwork sections; in applicable fire suppression, plumbing, HVAC, electrical, communications, electronic safety and security, and utilities sections; and in Section 024116 "Structure Demolition" and Section 024119 "Selective Demolition."

D. Excavate and remove underground utilities that are indicated to be removed.

E. Fill abandoned piping with cement slurry.

F. Securely close ends of abandoned piping with tight fitting plug or cement slurry minimum 6 inches thick.

3.6 CLEARING AND GRUBBING

A. Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction.

1. Grind down stumps and remove roots larger than 3 inches in diameter, obstructions, and debris to a depth of 18 inches below exposed subgrade.
2. Use only hand methods or air spade for grubbing within protection zones.

B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

1. Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

C. Areas to be grade shall be cleared of existing vegetation, rubbish, existing structures and debris.

3.7 TOPSOIL STRIPPING

A. Remove sod and grass before stripping topsoil.

B. Strip topsoil to depth will be relatively shallow (6 inches) in a manner to prevent intermingling with underlying subsoil or other waste materials. Deeper stripping and grubbing may be required to remove isolated concentrations of organic matter or roots.

C. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water.

3.8 SITE IMPROVEMENTS

A. Remove existing above- and below-grade improvements as indicated and necessary to facilitate new construction.

3.9 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off State's property.

B. Separate recyclable materials produced during site clearing from other nonrecyclable materials. Store or stockpile without intermixing with other materials, and transport them to recycling facilities. Do not interfere with other Project work.

END OF SECTION 311000

SECTION 312000

EARTH MOVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for walks and pavements.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Subbase course for concrete walks and pavements.
6. Subbase course and base course for asphalt paving.
7. Excavating and backfilling trenches for utilities and pits for buried utility structures.

1.2 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Base Course: Aggregate layer placed between the subbase course and hot-mix asphalt paving.

C. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by State's Representative. Authorized additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
2. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by State's

Representative. Unauthorized excavation, as well as remedial work directed by State's Representative, shall be without additional compensation.

G. Fill: Soil materials used to raise existing grades.

H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct preexcavation conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Material test reports.

1.5 FIELD CONDITIONS

A. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.

B. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.

C. Protect open excavations, trenches, and the like with fences, covers and railing to maintain safe pedestrian and vehicular traffic passages.

D. 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

2.1 SOIL MATERIALS

A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D2487 or Groups A-1, A-2-4, A-2-5, and A-3 according to AASHTO M 145, or a combination of these groups; free of rock or gravel larger than 3 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D2487, Groups A-2-6, A-2-7, A-4, A-5, A-6, and A-7 according to AASHTO M 145, or a combination of these groups.

1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.

D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

E. Base Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 95 percent passing a 1-1/2-inch sieve and not more than 8 percent passing a No. 200 sieve.

F. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; with at least 90 percent passing a 1-1/2-inch sieve and not more than 12 percent passing a No. 200 sieve.

G. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D2940/D2940M; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

H. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2-inch sieve and zero to 5 percent passing a No. 8 sieve.

2.2 ACCESSORIES

A. Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility; colored to comply with local practice or requirements of authorities having jurisdiction.

B. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep; colored to comply with local practice or requirements of authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.

B. Protect and maintain erosion and sedimentation controls during earth-moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

3.3 EXCAVATION FOR STRUCTURES

A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.

1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
2. Pile Foundations: Stop excavations 6 to 12 inches above bottom of pile cap before piles are placed. After piles have been driven, remove loose and displaced material. Excavate to final grade, leaving solid base to receive concrete pile caps.
3. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch. Do not disturb bottom of excavations intended as bearing surfaces.

B. Excavations at Edges of Tree- and Plant-Protection Zones:

1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 SUBGRADE INSPECTION

A. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by State's Representative, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by State's Representative.

1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by State's Representative.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Trenches under Roadways: Provide 4-inch thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway subbase course. Concrete is specified in Section 033000 "Cast-in-Place Concrete."

D. Initial Backfill: Place and compact initial backfill of subbase material or satisfactory soil, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

E. Final Backfill: Place and compact final backfill of satisfactory soil to final subgrade elevation.

F. Warning Tape: Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks and pavements, use satisfactory soil material.
3. Under steps and ramps, use engineered fill.
4. Under building slabs, use engineered fill.
5. Under footings and foundations, use engineered fill.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D698 or ASTM D1557:
   1. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
   2. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.
   3. For utility trenches, compact each layer of initial and final backfill soil material at 85 percent.

3.13 GRADING

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

B. Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

   1. Turf or Unpaved Areas: Plus or minus 1 inch.
   2. Walks: Plus or minus 1 inch.
   3. Pavements: Plus or minus 1/2 inch.

3.14 SUBBASE AND BASE COURSES UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course and base course under pavements and walks as follows:

   1. Shape subbase course and base course to required crown elevations and cross-slope grades.
   2. Place subbase course and base course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
   3. Compact subbase course and base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to [ASTM D698] [ASTM D1557].

3.15 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

A. Place drainage course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:

1. Place drainage course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.
2. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D698.

3.16 FIELD QUALITY CONTROL

A. Special Inspections: State will engage a qualified special inspector to perform inspections:

B. Testing Agency: State will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by State's Representative.

E. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off State's property.

END OF SECTION 312000

SECTION 31 23 33

TRENCHING AND BACKFILLING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Trenching and backfilling for utilities.

B. Related Sections include but are not necessarily limited to:

1. Section 31 10 00 – Site Clearing
2. Section 31 20 00 – Earth Moving

1.2 REFERENCES

A. Definitions:

1. Pipe Base: Area containing pipe bedding material between the bottom of the trench and the bottom of the pipe extending the full width and length of trench.
2. Pipe Zone: Area containing the initial backfill material between the bottom of the pipe and a minimum of 12-inches above the pipe extending the full width and length of trench.
3. Backfill Zone: Area containing the trench backfill material above the Pipe Zone to the ground surface or beneath the road section extending the full width and length of trench.
4. Optimum Moisture Content: The moisture content at which the soil attains maximum dry density with respect to the specific amount of compaction energy applied to the soil.
5. Prepared Subgrade: Material at bottom of trench that, as determined by the geotechnical engineer, has been freed from rocks and projecting objects, has been backfilled and compacted from over-excavation or removal of unsuitable material, has been scarified and compacted, or is otherwise suitable in its native state for supporting the trench section.
6. Relative Compaction: Field-measured dry weight expressed as a percent of maximum dry density of same soil determined in accordance with ASTM D1557 or ASTM D698 as indicated.
7. Road Section: Area above the Backfill Zone comprised of the road base and asphalt section extending the width of the trench and beyond each side as shown on the Drawings.

8. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by State's Representative.
9. Unstable Subgrade: Soils identified by the Geotechnical Engineer as unsuitable for supporting the pipe, backfill, and road section.

B. Reference Standards:

1. ASTM International (ASTM):

   a. C33– Standard Specification for Concrete Aggregates.
   b. D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

   c. [D671 – Standard Test Method for Flexural Fatigue of Plastics.
   d. D792 – Standard Test Methods for Density of Plastics by Displacement.
   e. D882 – Standard Test Method for Tensile Properties and Elongation of Thin Plastic Sheeting.]
   f. D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
   g. D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

   h. [D2103 – Standard Specification for Polyethylene Films and Sheeting.]
   i. D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
   j. D2922 – Test Method for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   k. D2937 – Standard Test Method for Density of Soil in Place by the Drive-Cylinder Method
   l. D3017 – Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   m. D4253 – Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.
   n. D4254 – Standard Test Methods for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.
   o. D2578 – Standard Test Method for Wetting Tension of Polyethylene and Polypropylene Films.
   p. D6938 – Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

2. Cal-OSHA – Standards and Requirements for Trench Bracing and Shoring.

1.3 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures for general submittal requirements and content.

B. Informational Submittals:

1. Test Reports: Submit results of independent testing and laboratory tests.
2. Certificates: California Mine Identification Number of each site from which products or materials have been purchased.

1.4 QUALITY ASSURANCE

A. Retain an independent soils laboratory/geotechnical engineer to conduct in-place moisture and density tests, to inspect exposed subgrade conditions, and to determine the suitability of backfill material.

B. Conduct all Work under the general observation and, where required, the detailed inspection of a qualified geotechnical engineer. Do not backfill until each specific location is approved.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stockpile suitable bedding and backfill material within rights-of-way and easements, away from interference with traffic, nearby residents, and drip line of remaining trees.

B. Do not allow materials to mix.

C. Cover stockpiled material to prevent windblown dust and do not allow material to erode or wash into trench, onto road, or onto adjacent property.

1.6 SITE CONDITIONS

A. Provide full access to public and private premises and fire hydrants at street crossings, sidewalks, and where shown on the drawings or designated by State's Representative to prevent interruption of vehicular or pedestrian travel.

B. The location, size, and depth or invert elevation of existing utilities as shown on the drawings are based on information from various sources, the accuracy of which has not been verified. Such information serves only as an approximation. Verify all existing utilities prior to construction.

C. Do not interrupt utilities serving facilities occupied by DPR or others unless permitted in writing by the State's Representative and then only after arranging to provide temporary utility services where indicated.

1. Notify the State's Representative not less than two (2) days in advance of proposed utility interruptions.
2. Do not proceed with utility interruptions without State's Representative's written permission.
3. Contact utility-locator service for area where Project is located before excavating.

1.7 WARRANTY

A. Settlement in trench backfill or in structures built over or adjacent trench backfill that occurs within the specified project warranty period shall be corrected at no additional cost to DPR. Any structures or foundations damaged by settlement shall be restored to their original condition at no additional cost to DPR.

PART 2 – PRODUCTS

2.1 BEDDING MATERIAL

A. PVC pipe, polyethylene encased ductile iron pipe, and conduit less than 3-inch diameter:

1. Sand free from clay, organic, or deleterious material conforming to ASTM C33.

	% Passing
⅜-inch square sieve	100%
No. 4 square sieve	95% - 100%
No. 8 square sieve	85% – 100%
No. 16 square sieve	50% – 85%
No. 30 square sieve	25% – 60%
No. 50 square sieve	10% – 30%
No. 100 square sieve	2% – 10%
No. 200 square sieve	1%

B. All other underground piping materials 3-inch or larger diameter, unless otherwise shown on the drawings:

1. Crushed, partially crushed, or naturally occurring granular material, free from organic and inorganic debris, liquid limit less than 25, and plasticity index less than 9, in accordance with ASTM C33, Size #67.

	% Passing
Passing 1-inch square sieve	100%
Passing ¾-inch square sieve	90%-100%
Passing 3/8-inch square sieve	20% to 55%
Passing No. 4 square sieve	0%-10%
Passing No. 8 square sieve	0%-5%

2.2 INITIAL BACKFILL MATERIAL

A. Same as Bedding Material.

2.3 BACKFILL MATERIAL

A. Native material free from ice, clay, debris and excessive organic matter and rocks greater than 3-inches in size.

2.4 CONCRETE ENCASEMENT

A. Provide non-structural controlled density fill, 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. 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.

2.5 WARNING TAPE

A. Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 4-inches wide and 4-mils thick, continuously inscribed with a description of the utility. Provide color in accordance with APWA Color Code.

2.6 DETECTABLE WARNING TAPE

A. Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 4-inches wide and 4-mils thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30-inches deep. Provide color in accordance with APWA Color Code.

2.7 TRACER WIRE

A. General: Minimum #12 AWG stranded copper wire with blue THW, THWN, or THHN rated insulation.

PART 3 – EXECUTION

3.1 PREPARATION

A. Verify location of existing underground utilities, overhead utilities, benchmarks, monuments, and property and ROW markers.

B. Do not start trench excavation until work in trench is ready to progress. Any trench or portion thereof left open and idle for 7-calendar days shall be refilled at the direction of the State's Representative at no additional cost to DPR.

C. Protect and maintain benchmarks, monuments, or other established points and reference points. Retain the services of a surveyor licensed in the State of California to replace in kind any such items damaged or destroyed at no additional cost to DPR.

D. Sawcut pavement, curbs, gutters, sidewalks, and other surfaces prior to removal. Unless otherwise shown, remove concrete surfaces to the nearest joint.

3.2 GROUNDWATER DEWATERING

A. Review soils investigation before beginning excavation and determine where groundwater is likely to be encountered during excavation.

B. Obtain all permits necessary for the disposal of groundwater.

C. Install a dewatering system where groundwater is or is expected to be encountered during excavation to allow placement of pipe, bedding, and backfill material in a dry and stable trench.

D. Install as many groundwater monitoring wells as necessary prior to excavation to draw down and maintain the groundwater level at least 3-feet below the bottom of any trench or manhole excavation.

E. Provide temporary treatment where necessary to comply with the discharge permit.

F. Provide piping complete with anchorage and restraints to point of discharge. Neither open trenching nor the DPR's utilities may be used for disposal unless otherwise shown.

G. Keep the dewatering system in operation until the dead load of pipe, structures, and backfill exceeds buoyant uplift force.

H. Maintain a water supply to any private and public wells affected by the dewatering operation. Correct any damage caused to private wells as a result of dewatering.

I. Dispose of groundwater in accordance with the requirements of the permit to an area that will not interfere with construction operations or damage existing construction.

J. Slowly shut off the dewatering system to prevent an upsurge of water that might weaken the subgrade.

K. Abandon wells after testing and acceptance of pipeline in accordance with local and State requirements.

3.3 TRENCH EXCAVATION

A. General

1. Excavate to the depth and width as shown on the drawings. Allow for cover and bedding material under pipe bells.
2. For fused pipe, excavate a length of trench required so that bending and lowering the pipe into the trench does not exceed the manufacturer's minimum recommended bend radius.
3. Remove projecting stones and sharp objects along trench subgrade.
4. Maintain and trim excavated materials in such a manner to be as little inconvenience as possible to public and adjoining property owners.

B. Trenches in Tree- and Plant-Protection Zones

1. Hand-excavate cross-sections, elevations, and subgrades indicated. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.

2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.
3. Cut and protect roots according to requirements in Section 01 56 39 – Temporary Tree and Plant Protection.

C. Trenching Near Existing Utilities

1. The type and condition of existing utility backfill is unknown. Flatten slopes and/or install shoring where work adjacent existing utility trenches cause sidewall instability or sloughing.
2. Support existing buried utilities where proposed work crosses beneath.
3. Repair any damage to existing utilities to the utility Owner's standards at no additional cost to DPR.

3.4 TRENCH SAFETY

A. Provide trench bracing and shoring on all trenches over 5-feet in depth, where temporary slopes must be steeper than those required by Cal/OSHA, and in compliance Cal-OSHA requirements.

B. Provide a Cal/OSHA approved "competent person" onsite during all work involving excavations greater than 5-feet in depth.

C. Safety shields/trench boxes do not directly support trench side walls. Size shields to minimize clearance between the shield and trench sidewall and limit use of shields to open areas where potential settlement behind the shield will not affect adjacent improvements.

D. Where top of trench is sloped back in lieu of trench bracing, maintain at least 2-feet width above top of pipe before sloping begins. Sloping, unless otherwise approved by the State's Representative, shall not be steeper than 1(H):1(V).

E. No trench shall be left open at the end of day.

F. Backfill or plate over trenches left open at the end of each day.

3.5 SUBGRADE PREPARATION

A. Over-Excavation

1. Where excavation exceeds the required depth for bedding, fill the excess depth with suitable native fill approved by State's Representative to proper subgrade, moisture condition to 2 percent of optimum moisture, and compact to 90 percent per ASTM D698.

B. Rock Excavation

1. Excavate 6-inches min below bottom of the pipe or conduit, removing all sharp or jagged rocks projecting into the trench. Backfill to subgrade with suitable native material or bedding material to subgrade, moisture condition to 2 percent of optimum moisture, and compact to 90 percent per ASTM D698.

C. Unstable Subgrade

1. Notify State's Representative when unstable soils are encountered.
2. Remove to extents directed by the State's Representative and backfill as required for over-excavations unless otherwise directed.

3.6 BACKFILL AND COMPACTION

A. General

1. Do not place backfill until work has been inspected and tested and has been accepted by the State's Representative.
2. Do not backfill or place flowable fill against masonry or concrete structures until they have attained their design strength.
3. Do not place frozen bedding or backfill material.
4. Place bedding and backfill on subgrades free of standing water, mud, frost, snow, or ice.
5. Keep trenches free of surface water runoff.
6. Fill and compact unauthorized excavation at no additional cost to DPR.
7. See Section 015639 - Temporary Tree and Plant Protection for backfilling and compaction requirements in tree protection zones.

B. Pipe Base

1. Place bedding material to the full width of trench in layers not exceeding 6-inches deep and compact.
2. Hand grade bedding material to support the pipe along its entire length. Shape bedding to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Unless shown otherwise, minimum depth of bedding below pipe shall be 4-inches and not less than 3-inches under pipe bell.
3. Hand-tamp sand bedding material and consolidate using a walk-behind vibratory plate to a firm and unyielding condition as determined by the Geotechnical Engineer.

C. Pipe Zone

1. Restrain pipe from lateral movement when placing fill from the bottom of the pipe to the springline.
2. Place bedding material on both sides of pipe simultaneously in lifts not to exceed 6-inches. Slice with a shovel and hand tamp until all voids around pipe are filled.

3. Place a minimum of 12-inches of cover over plastic pipe before consolidating with mechanical equipment. Use a walk-behind vibratory plate to consolidate initial backfill to a firm and unyielding condition as determined by the Geotechnical Engineer.

D. Backfill Zone

1. Place backfill material in lifts not exceeding 6-inches for hand-operated mechanical compactors and not exceeding 8-inches for heavy equipment compactors. Moisture condition to 3 percent above optimum moisture and compact.
2. Do not use heavy equipment for compaction until at least 2-feet of cover (initial backfill + backfill) has been placed over rigid pipe and 3-feet of cover over plastic pipe.
3. Ponding or jetting is not permitted except where required in tree protection zones.

E. Electrical Trenches

1. Comply with pipe trench backfill requirements. See details for additional information.

F. Direct Buried Cables

1. See notes and drawing details for trench backfill.

3.7 COMPACTION TESTING

A. Allow testing agencies to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent work only after test results for previously completed work comply with requirements.

B. Test compaction of soils in place according to ASTM D1556, D6938, or D2937, as applicable. Perform field moisture tests in accordance with ASTM D3017.

C. Conduct tests during backfilling at the following locations and frequencies at a minimum:

1. For trenches less than 30-inches in depth, perform density tests within 18-inches above the top of pipe or conduit and at the surface.
2. For trenches greater than 30-inches in depth, perform density tests within 18-inches of the top of the pipe or conduit, and at 2-foot vertical intervals to the top of the trench with the final test at the surface/top lift.
3. For utility mains conduct one (1) set of tests per 150-feet of linear trench at specified depths and for service lines conduct one (1) test per every service line per utility type at specified depths.

4. At a minimum, test intervals and quantities shall meet or exceed the requirements of the local utility agency.

D. Where compaction tests indicate a failure to meet the specified compaction, take additional tests every 15-feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

3.8 SURFACE RESTORATION

A. Unless otherwise shown on the drawings restore the surface to the original line and grade, repair road section(s) in kind, replace and shrubs damaged or destroyed in landscaped borders, and restore turf, mulch, or landscape materials to pre-construction condition.

3.9 REPAIR OF TRAFFIC UTILTIES, SIGNS, AND PVEMENT MARKINGS

A. Promptly notify utility Owner and coordinate repair of their utilities, signs, and pavement markings to their standards.

B. Provide temporary traffic control where lighted traffic signals or signage are damaged or disrupted by the Work.

C. Where traffic loop conductors are damaged, replace the entire conductor from loop to pull box.

D. Replace damaged street and traffic lighting conductors between existing pull boxes or install new pull box(es) to splice wires.

3.10 FIELD QUALITY CONTROL

A. Trenching and backfilling shall have the approval of the State's Representative. Perform Work under general observation and, where required, the detailed inspection of the State's Representative. Do not backfill until each specific location is approved.

3.11 SITE SECURITY

A. Secure the site, trenches, and utilities at the end of each workday.

1. Plug the end of all exposed pipes.
2. Plate over all open trenches in roadways, any trench that is greater than 5-feet deep, or trenches with standing water.
3. Provide and maintain portable fencing as needed to secure the work area.

3.12 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off the State's property.

B. See Section 01 74 19 - Construction Waste Management and Disposal.

END OF SECTION

SECTION 321123

AGGREGATE BASE COURSE

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Aggregate base course in accordance with Section 26 of Caltrans Standard Specifications as modified herein.

B. Related Sections include but are not necessarily limited to:

1. Section 00 08 03 – Mined Products and Materials
2. Section 01 56 39 – Temporary Tree and Plant Protection
3. Section 31 10 00 – Site Clearing

1.2 REFERENCES

A. Reference Standards:

1. ASTM International (ASTM):

a. C33– Standard Specification for Concrete Aggregates.
b. D698 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).
c. D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).
d. D2950 – Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods.
e. D4355 – Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture, and Heat in a Xenon Arc-Type Apparatus.
f. D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.D4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
g. D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
h. D4751 – Standard Test Methods for Determining Apparent Opening Size of a Geotextile.
i. D4833 – Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.

1.3 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures for general submittal requirements and content.

B. Action Submittals:

1. Product data:

a. Aggregate base
b. Non-Woven Geotextile fabric

C. Informational Submittals:

1. Test Reports: Submit results of independent testing and laboratory tests.
2. Certificates: California Mine Identification Number of each site from which products or materials have been purchased.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Stockpile suitable backfill material within rights-of-way and easements and away from the drip line of remaining trees.

B. Do not allow materials to mix.

C. Cover stockpiled material to prevent windblown dust and do not allow material to erode or wash into excavation or onto adjacent property.

PART 2 – PRODUCTS

2.1 AGGREGATE BASE

A. Class 2, 3/4-inch maximum. Brown color with no reclaimed material. Aggregate base consistency shall be “dirty” with adequate fines for proper compaction and binding qualities. Rock shall be of angular shape, not rounded.

2.2 GEOTEXTILE

A. Woven geotextile fabric, manufactured for separation applications, made from polyolefins or polyesters; with elongation less than 50 percent; complying with AASHTO M288 and the following, measured per test methods referenced:

1. Survivability: Class 2; AASHTO M288.
2. Survivability:

a. Grab Tensile Strength: 247-lbf (1100 N); ASTM D4632.
b. Sewn Seam Strength: 222-lbf (990 N); ASTM D4632.

c. Tear Strength: 90-lbf (400 N); ASTM D4533.
d. Puncture Strength: 90-lbf (400 N); ASTM D4833.

3. Apparent Opening Size: No. 60 (0.250-mm) sieve, maximum; ASTM D4751.
4. Permittivity: 0.02 per second, minimum; ASTM D4491.
5. UV Stability: 50 percent after 500 hours' exposure; ASTM D4355.

2.3 QUALITY ASSURANCE

A. The contractor shall install an 80 sq/ft test section for State Representative approval prior to order, delivery, and installation of additional aggregate paving material.

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION

A. Prior to installation, shape areas to receive aggregate base to reflect the same linear grade and cross slopes as the desired finished surface.

B. Grade subgrade surface to within 0.05-foot of finish grade minus paving thickness.

C. Grade subgrade surface uniformly smooth and compact to meet or exceed 85% relative compaction.

D. Remove debris, loose dirt, and other extraneous materials.

E. Fill and compact any depressions in the subgrade and remove loose material to finish true to line and grade, presenting a smooth, compacted, and unyielding surface except where indicated otherwise.

F. If the subsurface soils have strength and cohesion to provide a stable base for the aggregate, apply a non- woven geotextile fabric to the prepared area.

G. The State’s Representative shall approve all staking prior to installation of aggregate paving.

3.2 INSTALLATION OF AGGREGATE PAVING

A. Uniformly spread aggregate smoothly over the prepared subgrade.

B. Apply the aggregate base to the designated areas at a minimum total depth of 6-inches in two separate 3-inch lifts. Shape the final lift and compact it to the proper lines, grades, and slopes as shown on plans.

C. Moisture condition aggregate base to 3% above of optimum moisture and compact with a minimum of four passes over the entire paved area for each lift to a minimum 90% per ASTM D2950.

3.3 TOLERANCES

A. Finished surface smoothness: Maximum 3-inches in 10-feet any direction.

END OF SECTION 321123

SECTION 321216

HOT MIX ASPHALT PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes hot-mix asphalt paving, patching, paving overlay, AC dikes and pavement markings.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

B. Job-Mix Designs: Certification, by State's Representative, of approval of each job mix proposed for the work.

C. Material certificates of compliance for each type of asphalt binder indicated.

1.3 QUALITY ASSURANCE

A. Manufacturer Qualifications: The Contractor shall furnish asphalt in conformance with Caltrans' "Certification Program for Suppliers of Asphalt." Caltrans maintains the program requirements, procedures, and a list of approved suppliers at:

http://www.dot.ca.gov/hq/esc/Translab/fpmcoc.htm

B. The Contractor shall prevent the formation of carbonized particles caused by overheating asphalt during manufacturing or construction.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or damp or if the following conditions are not met:

1. Tack Coat: Minimum surface temperature of 50 deg F.
2. Asphalt Concrete: Minimum surface temperature of 50 deg at time of placement.

B. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of 40 deg Ffor oil-based materials, 50 deg Ffor water-based materials, and not exceeding 95 deg F.

PART 2 - PRODUCTS

2.1 AGGREGATES

A. Aggregates shall confirm to the ½-inch maximum, medium grading, Type A, specified in Section 39-2.02 of the Caltrans Standard Specification.

2.2 ASPHALT MATERIALS

A. Supply the type of asphalt binder for the following applications:

1. For hot-mix asphalt paving, patching, paving overlay: [PG 64-10]

B. Asphalt Binder shall conform to the following:

Property	AASHTO TEST METHOD	PG 64-10	PG 64-16	PG 64-28	PG 70-10
ORIGINAL BINDER					
Flash Point Minimum °C	T48	230	230	230	230
Solubility Minimum %	T44	99	99	99	99
Viscosity @ 135ºC Maximum, Pa·s	T316	3.0	3.0	3.0	3.0
Dynamic Shear, Test Temp at 10 rads/s,ºC Min G*/sin (delta), kPa	T315	64 1.00	64 1.00	64 1.00	70 1.00
RTFO Test Mass Loss, Max, %	T240	1.00	1.00	1.00	1.00
RTFO TEST AGED BINDER					
Dynamic Shear Test Temp at 10 rads/s,ºC Min G	T315	64 2.20	64 2.20	64 2.20	70 2.20
Ductility @ 25 ºC Min, cm	T51	75	75	75	75

PAV Aging, Temp ºC	R28	100	100	100	110
RTFO TEST AND PAV AGED BINDER					
Dynamic Shear Test Temp at 10 rads/s,ºC Min G	T315	 31 5000	 28 5000	 22 5000	 34 5000
Creep Stiffness Test Temp, ºC Max S-value, MPa Max M-Value	T313	 0 300 0.300	 -6 300 0.300	 -18 300 0.300	 0 300 0.300

2.3 BASE MATERIALS

A. Aggregate Base: Class 2, conforming to the requirements of Caltrans Standard Specifications Section 26, "Aggregate Bases".

B. Aggregate Base: Class 3, conforming to the requirements of Caltrans Standard Specifications Section 26, "Aggregate Bases".

2.4 AUXILIARY MATERIALS

A. Pavement-Marking Paint: Latex, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952, with drying time of less than 45 minutes.

2.5 MIXES

A. Hot-Mix Asphalt: Asphalt concrete shall be produced at a central mixing plant in conformance with Section 39-3 of the Caltrans Standard Specifications.

PART 3 - EXECUTION

3.1 COLD MILLING

A. Where shown on the plans, clean existing pavement surface of loose and deleterious material immediately before cold milling. Remove existing

asphalt pavement by cold milling to a depth of 1-1/2 inches or grades and/or cross sections indicated.

3.2 PATCHING

A. Hot-Mix Asphalt Pavement: Saw cut perimeter of patch a minimum of one-inch in depth and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inchesinto adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.

B. Tack Coat: Apply uniformly to vertical surfaces abutting or projecting into new, hot-mix asphalt paving at a rate of 0.05 to 0.15 gal./sq. yd..

C. Patching: Fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact flush with adjacent surface.

3.3 SURFACE PREPARATION

A. Proof-roll subbase using heavy, pneumatic-tired rollers to locate areas that are unstable or that require further compaction.

B. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.

1. Sweep loose granular particles from surface of unbound-aggregate base course. Do not dislodge or disturb aggregate embedded in compacted surface of base course.

C. Tack Coat: Apply uniformly to surfaces of existing pavement at a rate of 0.05 to 0.15 gal./sq. yd..

1. Allow tack coat to cure undisturbed before applying hot-mix asphalt paving.
2. Avoid smearing or staining adjoining surfaces, appurtenances, and surroundings. Remove spillage and clean affected surfaces.

3.4 HOT-MIX ASPHALT PLACING

A. Machine place hot-mix asphalt on prepared surface, spread uniformly, and strike off. Place asphalt mix by hand to areas inaccessible to equipment in a manner that prevents segregation of mix. Place each course to required grade, cross section, and thickness when compacted.

1. Spread mix at minimum temperature of 250 deg F (121 deg C).

2. 3” AC new surface maximum.

3. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.

B. Place paving in consecutive strips one half of the roadway width but not less than 10 feetwide unless infill edge strips of a lesser width are required.

C. Promptly correct surface irregularities in paving course behind paver. Use suitable hand tools to remove excess material forming high spots. Fill depressions with hot-mix asphalt to prevent segregation of mix; use suitable hand tools to smooth surface.

3.5 COMPACTION

A. General: Begin compaction as soon as placed hot-mix paving will bear roller weight without excessive displacement. Compact hot-mix paving with hot, hand tampers or vibratory-plate compactors in areas inaccessible to rollers.

1. Complete compaction before mix temperature cools to 185 deg F.

B. Breakdown Rolling: Complete breakdown or initial rolling immediately after rolling joints and outside edge. Examine surface immediately after breakdown rolling for indicated crown, grade, and smoothness. Correct laydown and rolling operations to comply with requirements.

C. Intermediate Rolling: Begin intermediate rolling immediately after breakdown rolling while hot-mix asphalt is still hot enough to achieve specified density. Continue rolling until hot-mix asphalt course has been uniformly compacted to the following density:

1. Average Density: 92 percent of reference maximum theoretical density according to ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

D. Finish Rolling: Finish roll paved surfaces to remove roller marks while hot-mix asphalt is still warm.

E. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.

F. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

3.6 INSTALLATION TOLERANCES

A. Thickness: Compact each course to produce the thickness indicated within the following tolerances:

1. Base Course: Plus or minus 1/2 inch.
2. Surface Course: Plus 1/4 inch, no minus.

B. Surface Smoothness: Compact each course to produce a surface smoothness within the following tolerances as determined by using a 10-footstraightedge applied transversely or longitudinally to paved areas:

1. Base Course: 1/4 inch
2. Surface Course: 1/8 inch

3.7 PAVEMENT MARKING

A. General: Pavement marking shall include new in-kind striping for all existing and/or new pavement or at locations shown on the plans or stripping that will be removed or covered due to new improvements.

B. Do not apply pavement-marking paint until layout, colors, and placement have been verified with State Representative.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of equal dimension of existing, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Broadcast glass spheres uniformly into wet pavement markings at a rate of 6 lb/gal..

3.8 DISPOSAL

A. Disposal of debris in accordance with Section 000804 - Disposal of Refuse.

END OF SECTION 321216

SECTION 321313

CONCRETE PAVING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes Concrete Paving including the Following:
   1. Parking lots.
   2. Curbs and gutters.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each type of product, ingredient, or admixture requiring color selection.

C. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1.3 INFORMATIONAL SUBMITTALS

A. Environmental Product Declarations (EPD):

   1. Provide Environmental Product Declarations for eligible materials where required by the Buy Clean California Act.
   2. EPDs shall comply with current requirements of the Buy Clean California Act and applicable State of California guidance in effect at the time of bid and construction.

1.4 QUALITY ASSURANCE

A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

   1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities" (Quality Control Manual - Section 3, "Plant Certification Checklist").

1.5 PRECONSTRUCTION TESTING

A. Preconstruction Testing Service: Engage a qualified independent testing agency to perform preconstruction testing on concrete paving mixtures.

PART 2 - PRODUCTS

2.1 CONCRETE, GENERAL

A. ACI Publications: Comply with ACI 301 unless otherwise indicated.

2.2 STEEL REINFORCEMENT

A. Plain-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, fabricated from as-drawn steel wire into flat sheets.

B. Deformed-Steel Welded-Wire Reinforcement: ASTM A1064/A1064M, flat sheet.

C. Reinforcing Bars: ASTM A615/A615M, Grade 60; deformed.

D. Joint Dowel Bars: ASTM A615/A615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A767/A767M, Class I coating. Cut bars true to length with ends square and free of burrs.

E. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded-wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.

2.3 CONCRETE MATERIALS

A. Cementitious Materials: Use the following cementitious materials, of same type, brand, and source throughout Project:

1. Portland Cement: ASTM C150/C150M, Portland cement Type II or Type V.
2. Fly Ash: ASTM C618, Class F.
3. Slag Cement: ASTM C989/C989M, Grade 100 or 120.

B. Normal-Weight Aggregates: ASTM C33/C33M, Class 4S uniformly graded. Provide aggregates from a single source.

C. Air-Entraining Admixture: ASTM C260/C260M.

D. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

E. Color Pigment: ASTM C979/C979M, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, free of carbon black, nonfading, and resistant to lime and other alkalis.

1. Color: As selected by State Parks' Representative from manufacturer's full range

F. Water: Potable and complying with ASTM C94/C94M.

2.4 CURING MATERIALS

A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry or cotton mats.

B. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

C. Water: Potable.

D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, dissipating.

F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 2, Class B, dissipating.

2.5 RELATED MATERIALS

A. Joint Fillers: ASTM D1751, asphalt-saturated cellulosic fiber or ASTM D1752, cork or self-expanding cork in preformed strips.

B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

2.6 CONCRETE MIXTURES

A. Prepare design mixtures, proportioned according to ACI 301, for each type and strength of normal-weight concrete, and as determined by either laboratory trial mixtures or field experience.

B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:

1. Fly Ash or Pozzolan: 25 percent.
2. Slag Cement: 50 percent.
3. Combined Fly Ash or Pozzolan, and Slag Cement: 50 percent, with fly ash or pozzolan not exceeding 25 percent.

C. Add air-entraining admixture at manufacturer's prescribed rate to result in normal-weight concrete at point of placement having an air content as follows:

1. Air Content: 6percent plus or minus 1-1/2 percent.

D. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.

E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

F. Concrete Mixtures: Normal-weight concrete.

1. Compressive Strength (28 Days): 4000 psi.
2. Maximum W/C Ratio at Point of Placement: 0.45 or 0.50.
3. Slump Limit: 4 inches

2.7 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to ASTM C94/C94M[and ASTM C1116/C1116M]. Furnish batch certificates for each batch discharged and used in the Work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Proof-roll prepared subbase surface below concrete paving at ADA parking stalls to identify soft pockets and areas of excess yielding.

3.2 PREPARATION

A. Remove loose material from compacted subbase surface immediately before placing concrete.

3.3 EDGE FORMS AND SCREED CONSTRUCTION

A. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

B. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

3.4 STEEL REINFORCEMENT INSTALLATION

A. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

3.5 JOINTS

A. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

B. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

C. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

D. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness or to match jointing of existing adjacent concrete paving.

E. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a 1/4-inch or 3/8-inch radius. Repeat tooling of edges after applying surface finishes.

3.6 CONCRETE PLACEMENT

A. Moisten subbase to provide a uniform dampened condition at time concrete is placed. Do not place concrete around manholes or other structures until they are at required finish elevation and alignment.

B. Comply with ACI 301 requirements for measuring, mixing, transporting, and placing concrete.

C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

D. Screed paving surface with a straightedge and strike off.

E. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleedwater appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

3.7 FLOAT FINISHING

A. General: Do not add water to concrete surfaces during finishing operations.

B. Float Finish: Begin the second floating operation when bleedwater sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.

1. Burlap Finish: Drag a seamless strip of damp burlap across float-finished concrete, perpendicular to line of traffic, to provide a uniform, gritty texture.
2. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface, perpendicular to line of traffic, to provide a uniform, fine-line texture.
3. Medium-to-Coarse-Textured Broom Finish: Provide a coarse finish by striating float-finished concrete surface 1/16 to 1/8 inch deep with a stiff-bristled broom, perpendicular to line of traffic.

3.8 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.

B. Comply with ACI 306.1 for cold-weather protection.

C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h

before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination of these.

3.9 PAVING TOLERANCES

A. Comply with tolerances in ACI 117 and as follows:

1. Elevation: 3/4 inch.
2. Thickness: Plus 3/8 inch, minus 1/4 inch.
3. Surface: Gap below 10-feet-long; unleveled straightedge not to exceed 1/2 inch.
4. Joint Spacing: 3 inches.
5. Contraction Joint Depth: Plus 1/4 inch, no minus.
6. Joint Width: Plus 1/8 inch, no minus.

3.10 REPAIR AND PROTECTION

A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by State’s Representative.

B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 321313

SECTION 321373

CONCRETE PAVING JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cold-applied joint sealants.
2. Joint-sealant backer materials.

B. Related Requirements

1. Section 321313 “Concrete Paving”.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Concrete pavement joint sealants.
2. Joint-sealant backer materials.

B. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of joint sealant.

C. Samples for Verification: Sample products for each kind and color of joint sealant required.

D. Shop Drawings: Contractor to submit a joint plan diagram illustrating location of all proposed joints and joint types for review and approval.

1.3 INFORMATIONAL SUBMITTALS

A. Qualification Statements: For Installer.

1.4 QUALITY ASSURANCE

A. Qualifications:

1. Installers: Entity that employs installers and supervisors who are trained and approved by manufacturer.

1.5 FIELD CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F.
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 JOINT SEALANTS, GENERAL

A. Compatibility: Provide joint sealants, backer materials, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by joint-sealant manufacturer, based on testing and field experience.

2.2 COLD-APPLIED JOINT SEALANTS

A. Single-Component, Self-Leveling, Silicone Joint Sealant: ASTM D5893/D5893M, Type SL.

1. 300 Sl by Pecora Corporation, Harleysville, PA, (215) 723-6051.
2. RoadSaver Silicone SL by Crafco, Inc, Chandler, AZ, (602) 276-0406.
3. Or approved equal.

2.3 JOINT-SEALANT BACKER MATERIALS

A. Joint-Sealant Backer Materials: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by joint-sealant manufacturer, based on field experience and laboratory testing.

B. Round Backer Rods for Cold-Applied Joint Sealants: ASTM D5249, Type 3, of diameter and density required to control joint-sealant depth and prevent bottom-side adhesion of sealant.

C. Backer Strips for Cold- and Hot-Applied Joint Sealants: ASTM D5249; Type 2; of thickness and width required to control joint-sealant depth, prevent bottom-side adhesion of sealant, and fill remainder of joint opening under sealant.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Before installing joint sealants, clean out joints immediately to comply with joint-sealant manufacturer's written instructions.

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

B. Joint Priming: Prime joint substrates where indicated or where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

3.3 INSTALLATION OF JOINT SEALANTS

A. Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated unless more stringent requirements apply.

B. Joint-Sealant Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions.

C. Install joint-sealant backers to support joint sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of joint-sealant backer materials.
2. Do not stretch, twist, puncture, or tear joint-sealant backer materials.
3. Remove absorbent joint-sealant backer materials that have become wet before sealant application and replace them with dry materials.

D. Install joint sealants immediately following backer material installation, using proven techniques that comply with the following:

1. Place joint sealants so they fully contact joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

E. Tooling of Non-sag Joint Sealants: Immediately after joint-sealant application and before skinning or curing begins, tool sealants in accordance with the following requirements to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint:

1. Remove excess joint sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by joint-sealant manufacturer and that do not discolor sealants or adjacent surfaces.

F. Provide joint configuration to comply with joint-sealant manufacturer's written instructions unless otherwise indicated.

3.4 CLEANING AND PROTECTION

A. Clean off excess joint sealant as the Work progresses, by methods and with cleaning materials approved in writing by joint-sealant manufacturers.

B. Protect joint sealants, during and after curing period, from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately and replace with joint sealant so installations in repaired areas are indistinguishable from the original work.

3.5 PAVING-JOINT-SEALANT SCHEDULE

A. Joints within concrete paving:

1. Joint Location:
   a. Expansion and isolation joints in concrete paving.
   b. Other joints as indicated.
2. Joint Sealant: Single-component, self-leveling, silicone joint sealant.
3. Joint-Sealant Color: To be selected by Landscape Architect from Manufacturer's full range of colors.

END OF SECTION

SECTION 321400

STONE PAVING

PART 1 – GENERAL

1.1 SUMMARY

A. Mortar-set flagstone paving over concrete subslab.

B. Related Sections: Coordinate Stone Paving with related assemblies and adjacent Work.

1. 321313 “Concrete Paving”.

2. 327700 “Aggregate Surfacing”.

1.2 ACCESSIBILITY REQUIREMENTS

A. Provide installation complying with accessibility requirements indicated on the Drawings and applicable governing codes.

1.3 ACTION SUBMITTALS

A. Product Data: For all materials other than water and aggregates.

B. Samples: Provide two (3) physical samples at least 12 inches by 12 inches square representative of full color range of proposed stone.

1.4 INFORMATIONAL SUBMITTALS

A. Submit three (3) examples of similar work successfully completed by proposed Installer.

1.5 MOCK-UP

A. Mockup: Construct a minimum 10’x10’ sample panel demonstrating stone selection, jointing, workmanship, and overall appearance.

a. A portion of the mock-up shall include the proposed radius edge.

B. The approved mock-up shall represent the standard for the completed Work. The approved mock-up may be used as part of the completed Work if undisturbed at the time of substantial completion.

1.6 PRE-INSTALLATION MEETING

A. Hold a pre-installation conference in accordance with Section 013100 prior to start of Stone Paving installation.

B. Review related project requirements and submittals, status of substrate work and preparation, areas of potential conflict and interface, availability of stone paving and components, installer qualifications, equipment, and coordinate methods, procedures, and sequencing requirements for full and proper installation and protection.

1.7 PROJECT CONDITIONS

A. Cold-Weather Protection: Do not use frozen materials or build on frozen subgrade or setting beds.

B. Weather Limitations for Mortar:

1. Cold Weather Requirements: Comply with cold-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602.

2. Hot-Weather Requirements: Comply with hot-weather construction requirements contained in ACI 530.1/ASCE 6/TMS 602. Do not apply mortar to substrates with temperatures of 100 degrees F and higher.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An installer who employs experienced stone masons and stone fitters who are skilled in construction of mortar-set natural stone paving of similar scope and character to Work indicated in the Drawings.

PART 2 – PRODUCTS

2.1 STONE PAVING

A. Flagstone: Subject to compliance with requirements, provide stone of the following variety and from the following source:

1. Natural stone flagstone suitable for exterior pedestrian paving.

2. Thickness: 2 inches nominal.

3. Color and Texture: As approved by State’s Representative from submitted samples.

4. Provide stone from a single quarry or supplier.

5. Provide a range of stone sizes and shapes suitable for installation of a natural appearing flagstone paving surface.

6. Stone shall be sound and free from defects that adversely affect durability or appearance.

2.2 MORTAR SETTING MATERIALS

A. General:

1. Provide setting bed, mortar, grout, and accessory materials compatible with stone paving units, concrete substrate, and anticipated service conditions.

2. Materials shall be provided by a single manufacturer where practical and installed in accordance with manufacturer's written instructions.

B. Mortar Setting Bed:

1. Type S Mortar complying with ASTM C270.

2. Mortar shall be suitable for exterior horizontal stone paving installation.

C. Bonding Agent:

1. Provide latex bonding agent or bonding slurry where required by manufacturer or indicated on Drawings.

2. Bonding materials shall be compatible with concrete substrate and setting bed mortar.

D. Joint Mortar:

1. Type S Mortar complying with ASTM C270.

2. Color: Natural Gray unless otherwise indicated.

E. Accessory Materials:

1. Provide primers bonding agents, additives, and other materials recommended by manufacturer for complete installation.

F. Cleaning Materials:

1. Provide cleaning materials recommended by the manufacturer.

2. Do not use acidic cleaners or materials that may stain, etch, or damage stone, mortar, or adjacent materials.

    a. Include alternate mixtures when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify concrete substrate has been installed to required lines, elevations, slopes, and surface tolerances.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. General:

1. Install flagstone paving in accordance with approved Shop Drawings and accepted mockup.

2. Mix stone from multiple palettes or bundles during installation to provide a uniform distribution of color, texture, size, and character.

3. Use full stones where practical. Where cutting is required, neatly cut stone with masonry saw equipment.

B. Mortar Setting Bed:

1. Prepare substrate as required by mortar manufacturer.

2. Place mortar setting bed to thickness indicated.

3. Fully support each stone unit in mortar. Do not allow voids that may result in rocking or instability.

4. Place only as much mortar as can be covered with stone before initial set occurs.

C. Flagstone Installation:

1. Set stone true to line and grade indicated.

2. Maintain consistent surface appearance and alignment throughout installation.

3. Install with nominal joint widths indicated on Drawings.

4. Completely fill joints with mortar.

D. Accessibility Requirements:

1. Provide a stable, firm, and slip-resistant surface.

2. Maximum joint width shall be 1/2 inch.

3. Maximum mortar recess below adjacent stone surfaces shall be 1/4 inch.

4. Maximum vertical displacement between adjacent stone units shall be 1/4 inch.

E. Tolerances:

1. Do not exceed 1/4 inch variation from plane in 10 feet when measured with a 10-foot straightedge.

2. Maintain positive drainage and indicated slopes.

3.3 CLEANING AND PROTECTION

A. Remove excess mortar from exposed stone surfaces as Work progresses.

B. Clean finished paving in accordance with manufacturer's written recommendations.

C. Protect completed paving from damage, staining, and construction traffic until Substantial Completion.

D. Remove and replace paving that is cracked, loose, stained, damaged, or does not comply with specified requirements. Replacement work shall match adjacent accepted work and be subject to the same requirements as the original installation.

END OF SECTION 321400

SECTION 321713

PARKING BUMPERS

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes wheel stops.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

PART 2 - PRODUCTS

2.1 PARKING BUMPERS

A. Concrete Wheel Stops:` Precast, steel-reinforced, air-entrained concrete, 4000-psiminimum compressive strength, 4-1/2 inches high by 9 inches wide by 72 inches long Provide chamfered corners, transverse drainage slots on underside, and a minimum of two factory-formed or -drilled vertical holes through wheel stop for anchoring to substrate.

1. Mounting Hardware: Galvanized-steel spike or dowel, 1/2-inch diameter, 10-inch minimum length.

2. Available from Bohlmann or equal.
   a. https://bohlmann.com/72-parking-curb

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install wheel stops according to manufacturer's written instructions unless otherwise indicated.

B. Install wheel stops in bed of adhesive before anchoring.

C. Securely anchor wheel stops to pavement with hardware in each preformed vertical hole in wheel stop as recommended in writing by manufacturer.

END OF SECTION 321713

SECTION 321723

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Painted markings applied to asphalt paving.
2. Painted markings applied to concrete surfaces.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Pavement-marking paint, solvent-borne.
2. Pavement-marking paint, acrylic.
3. Pavement-marking paint, latex.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Accessibility Standard: Comply with applicable provisions in the USDOJ's "2010 ADA Standards for Accessible Design", the ABA standards of the Federal agency having jurisdiction and ICC A117.1.

2.2 PAVEMENT-MARKING PAINT

A. Pavement-Marking Paint, Solvent-Borne: MPI #32, solvent-borne traffic-marking paint.

1. Color: White

B. Pavement-Marking Paint, Acrylic: Acrylic, waterborne emulsion, lead and chromate free, ready mixed, complying with FS TT-P-1952F, Type II, with drying time of less than 45 minutes.

1. Color: White

C. Pavement-Marking Paint, Latex: MPI #97, latex traffic-marking paint.

1. Color: White

PART 3 - EXECUTION

3.1 PAVEMENT MARKING

A. Do not apply pavement-marking paint until layout, colors, and placement have been verified with State's Representative.

B. Allow asphalt paving or concrete surfaces to age for a minimum of 30 days before starting pavement marking.

C. Sweep and clean surface to eliminate loose material and dust.

D. Apply paint with mechanical equipment to produce pavement markings, of dimensions indicated, with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils.

1. Apply graphic symbols and lettering with paint-resistant, die-cut stencils, firmly secured to asphalt paving or concrete surface.

END OF SECTION 321723

SECTION 321726

TACTILE WARNING SURFACING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Cast-in-place replaceable detectable warning tiles.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples for each type of exposed finish requiring color selection.

PART 2 - PRODUCTS

2.1 TACTILE WARNING SURFACING, GENERAL

A. Accessibility Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities for tactile warning surfaces.

1. For tactile warning surfaces composed of multiple units, provide units that when installed provide consistent side-to-side and end-to-end dome spacing that complies with requirements.

2.2 DETECTABLE WARNING TILES

A. Cast-in-Place Detectable Warning Tiles: Detectable warning surface shall be precast concrete tactile paving units suitable for exterior installation and compliant with accessibility requirements. Installation method shall be as recommended by manufacturer and compatible with the substrate and details shown on the Drawings.
   1. Material: Precast Concrete
   2. Color: As selected by State’s Representative from manufacturer's full line.
   3. Shapes and Sizes:
      a. Rectangular panel, 12-inch square, 2-inch minimum thick.
      b. Dome height, 0.2-inch.
   4. Dome Spacing and Configuration: 1.67-inch to 2.35-inch spacing, in square pattern.
   5. Mounting:

a. Install detectable warning tiles over cured concrete substrate using latex-modified thinset mortar.
b. Thinset mortar shall be acceptable for exterior use and recommended by the tile manufacturer for bonding precast concrete units to concrete substrates.
c. Install in accordance with manufacturer's written instructions and details shown on the Drawings.

2.3 ACCESSORIES

A. Thinset Mortar: Polymer-modified, latex-modified thinset mortar suitable for exterior applications and freeze-thaw exposure.
1. Usually retain Type 304 in first subparagraph below; retain Type 316 if required for corrosive environments.
2. Comply with ANSI A118.4 or ANSI A118.15.
3. Basis of Design: Laticrete 254 Platinum or approved equal.

B. Setting and Joint Materials:
1. Provide manufacturer's recommended primers, bonding agents, grout, sealants, and accessory materials required for complete installation.
2. Materials shall be compatible with detectable warning tiles, concrete substrate, and adjacent paving materials.

2.4 INSTALLATION OF TACTILE WARNING SURFACING

A. General: Prepare substrate and install tactile warning surfacing according to manufacturer's written instructions unless otherwise indicated.

B. Place tactile warning surfacing units in dimensions and orientation indicated. Comply with location requirements of AASHTO MP 12.

C. Precast Detectable Warning Tiles: Install detectable warning tiles accurately and firmly in place using latex-modified thinset mortar in accordance with the manufacturer's written instructions. Set tile surface flush with surrounding paving and adjacent tiles. Maintain uniform alignment and joint widths. Remove excess setting materials from exposed surfaces and clean tiles using methods recommended in writing by manufacturers.

D. Remove and replace tactile warning surfacing that is broken or damaged or does not comply with requirements in this Section. Remove in complete sections from joint to joint unless otherwise approved by State's Representative. Replace using tactile warning surfacing installation methods acceptable to State's Representative.

E. Protect tactile warning surfacing from damage and maintain free of stains, discoloration, dirt, and other foreign material.

PART 3 - EXECUTION

3.1 INSTALLATION OF TACTILE WARNING SURFACING

A. General: Prepare substrate and install truncated dome pavers according to manufacturer's written instructions unless otherwise indicated.

B. Place truncated dome paver units in dimensions and orientation indicated. Comply with applicable requirements of CBC Chapter 11B, ADA Standards for Accessible Design, and other applicable accessibility regulations having jurisdiction.

C. Install truncated dome pavers accurately and firmly in place using latex-modified thinset mortar in accordance with the manufacturer’s written instructions. Set tile surface flush with surrounding paving and adjacent tiles. Maintain uniform alignment and joint widths. Remove excess setting materials from exposed surfaces and clean tiles using methods recommended in writing by manufacturers.

D. Remove and replace truncated dome pavers that are broken or damaged or do not comply with requirements in this Section. Remove in complete sections from joint to joint unless otherwise approved by State’s Representative. Replace truncated dome pavers using installation methods acceptable to State’s Representative.

E. Protect tactile warning surfacing from damage and maintain free of stains, discoloration, dirt, and other foreign material.

END OF SECTION 321726

SECTION 323123

MOTORIZED METAL GATES

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:

1. Motorized vehicular swing gates.
2. Gate posts, support members, and operator connections.
3. Gate operator.
4. Detection loops.
5. Safety devices.
6. Gate controls and accessories.
7. Hinges, hardware, stops, and appurtenances.

B. Provide all devices, hardware, controls, safety equipment, appurtenances, and accessories required for a complete code-compliant and fully functional gate system whether specifically identified in the contract documents or not.

1.2 RELATED REQUIREMENTS

A. Section 033000 “Cast-in-Place Concrete”.

B. Section 055010 “Landscape Metal Work”.

C. Division 26 for power supply and electrical work.

D. Section 321723 “Pavement Markings”.

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Gate fabricator and operator supplier shall submit a single coordinated package.

B. Coordinated Shop Drawing package shall include:

1. Gate dimensions.

2. Frame member sizes.
3. Posts and foundations.
4. Hinge details.
5. Operator mounting.
6. Safety devices.
7. Loop detector locations.
8. Electrical connections.
9. Control devices.
10. Clearances and operating envelope.

1.4 INFORMATIONAL SUBMITTALS

A. Product Data.

B. Operator manufacturer's installation requirements.

C. Maintenance data.

D. Warranty information.

1.5 QUALITY ASSURANCE

A. Installer shall be regularly engaged in automated gate installation.

B. Gate assembly shall comply with ASTM F2200.

C. Operator system shall comply with UL 325.

D. Coordinate gate operator controls, emergency access devices, override functions, and related appurtenances with requirements of authorities having jurisdiction over emergency vehicle access.

E. Provide a complete emergency access system meeting requirements of the local fire authority including Knox devices, emergency-access controls, or other provisions required by authorities having jurisdiction.

1.6 PRE-INSTALLATION MEETING

A. Hold a pre-installation conference in accordance with Section 013100 prior commencing Work in this section.

B. Contractor shall coordinate the pre-installation meeting at a time when all attendees may attend:

1. Gate contactor.
2. Gate fabricator.
3. Operator supplier.
4. Electrical contractor.
5. State's Representative.

PART 2 – PRODUCTS

2.1 SWING GATE (G1)

A. Gate Assembly:

1. Double-leaf vehicular swing gate.
2. Dimensions as indicated on the Drawings.
3. Fabricated from steel pipe.
4. Provide fully welded construction.

B. Materials:

1. Steel pipe and shapes: as specified in Section 055010.
2. Fasteners: Type 316 stainless steel.
3. Finish: as specified in Section 055010.

C. Hinges:

1. Hinges: Heavy-duty weld-on serviceable barrel hinges.
2. Minimum 1-inch hinge pin.
3. Three (3) hinges per gate leaf.
4. Hinges shall support gate loads without binding or permanent deflection.

D. Gate Stops:

1. Provide open and closed position stops.

2. Stops shall prevent operator loads from being carried by the operator arm.

2.2 GATE OPERATOR

A. Basis of Design: Liftmaster CSW24UL.

B. Provide complete operator assembly including:

1. Operator.
2. Controls:
    a. Exterior keypad.
    b. Remote transmitters.
    c. Receivers.
    d. Accessories required for complete operation.
    e. Quantity of remotes: Four (4) transmitters unless otherwise directed by State's Representative.
3. Safety devices.
4. Loop detection modules.
5. Power supplies.
6. Battery backup:
    a. Battery backup shall be capable of maintaining operation during utility power interruption.
    b. Upon depletion of backup power, provide a fail-safe operation in accordance with AHJ requirements and operator manufacturer’s recommendations.
    c. Provide manual release capability for operation during power failure.
7. Emergency access system.
8. Mounting hardware.

C. Safety Devices:

1. Provide monitored entrapment protection devices required for code-compliant operation.
2. Devices shall be selected and installed in accordance with UL 325 and operator manufacturer’s requirements.

D. Loop Detectors:

1. Provide loop detectors and accessories required for operation indicated.

2. Coordinate loop locations with Drawings.

2.3 FINISH

A. Ferrous metal items:

1. Zinc-rich primer.

2. Epoxy intermediate coat.

3. Polyurethane finish coat.

B. Color: as selected by State's Representative.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Verify footing locations, power supply locations, conduits, and loop detector installation are complete.

3.2 INSTALLATION

A. Install gate, operator, controls, and accessories in accordance with manufacturer requirements.

B. Install components plumb, level, and properly aligned.

C. Adjust gate for smooth operation throughout its full range of travel.

D. Provide all accessories required for a complete functioning system whether or not specifically indicated.

3.3 FIELD TESTING

A. Demonstrate full gate operation through complete open and close cycles.

B. Demonstrate operation of all monitored safety devices.

C. Demonstrate operation of loop detection devices.

D. Demonstrate emergency access operation.

E. Demonstrate battery backup operation.

F. Demonstrate manual release operation.

G. Prior to acceptance, demonstrate compliance with emergency access requirements of the authority having jurisdiction.

3.4 DEMONSTRATION AND TRAINING

A. Provide onsite training for State staff covering:

1. Normal operation.
2. Manual override procedures.
3. Emergency access operation.
4. Battery backup operation.
5. Routine maintenance.
6. Troubleshooting procedures.

3.5 CLOSEOUT SUBMITTALS

A. Submit operation and maintenance manuals.

B. Submit wiring diagrams.

C. Submit programming information and access codes.

D. Submit warranty documentation.

E. Submit list of replacement parts and manufacturer contact information.

END OF SECTION 323123

SECTION 323300

SITE FURNISHINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Enclosed Bulletin Board

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Samples: For each exposed product and for each color and texture specified.

1.3 CLOSEOUT SUBMITTALS

A. Maintenance Data: For site furnishings to include in maintenance manuals.

B. Keys: Provide manufacturer’s keys to State’s Representative.

PART 2 - PRODUCTS

2.1 ENCLOSED BULLETIN BOARD

A. General: Provide enclosed bulletin board at Campfire Cener Entry Sign as indicated in the Drawings
   1. Manufacturer: Ghent or approved equal.
   2. Model: Series P2 Tackboard
   3. Details:
      a. Frame: Anodized extruded aluminum.
      b. 36-inch x 48-inch nominal size.
      c. Two (2) self-supporting doors with 1/8-inch-thick acrylic panes and keyed flush-mount tumble locks.
      d. Cork tackboard with manufacturer’s foil backing and silicone caulking.
   4. Finish: Manufacturer’s standard finish as selected in approved submittal.
   5. Mount: Manufacture’s standard metal brackets.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with manufacturer's written installation instructions unless more stringent requirements are indicated. Complete field assembly of site furnishings where required.

B. Unless otherwise indicated, install site furnishings after landscaping and paving have been completed.

C. Install site furnishings level, plumb, true, and securely anchored at locations indicated on Drawings.

END OF SECTION 323300

SECTION 327770

AGGREGATE SURFACING

PART 1 – GENERAL

1.1 DESCRIPTION

A. This section includes materials, source limitations, and execution information for Aggregate Base Surfacing as indicated in the Contract Drawings. Provide and place aggregate surface at the locations and to the dimensions shown on the plans.

1.2 REFERENCES

A. ASTM C136/136M, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

B. ASTM D4318, Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

C. ASTM D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

D. ASTM F1951 – 14, Standard Specification for Determination of Accessibility Under and Around Playground Equipment.

E. California State Parks Trails Handbook.

F. Caltrans Standard Specifications, Section 26 “Aggregate Bases”.

G. California Test 231, Method of Test of Relative Compaction of Untreated and Treated Soils and Aggregates Using Nuclear Gages”.

1.3 SUBMITTALS

A. Aggregate Source Identification: Provide certificate of compliance from aggregate base supplier or other approved proof of compliance with contract requirements for aggregate base material.

1. Aggregates shall be sourced from surface mines approved and licensed by the State of California. Source quarry shall commonly produce rock of the following types:

a. Metavolcanics, chert-bearing rock, hard sedimentary rock, or crushed granite derivatives.

2. Aggregates shall be free of invasive or noxious seeds and other organic materials.

3. Aggregates shall not contain serpentine content.

B. Product Data: for each product noted, including:

1. Gradation Test Results: for each aggregate product. Test results shall be performed within 12 months of submittal.

2. Plasticity Index Test Results: for Aggregate Top Course.

3. Design mixtures: For each aggregate paving mixture.

a. Include alternate mixtures when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

C. Physical Samples: for each aggregate product noted.

1. Provide a one-pound bag of specified aggregate and fines to confirm correct color and texture.

1.4 QUALITY ASSURANCE

A. The contractor shall install three (3) separate 50 sq/ft minimum test sections using aggregate surfacing materials obtained from the proposed source quarry. A test section shall be approved by the State Representative prior to order, delivery, and installation of additional aggregate paving material. Test sections shall be installed per this Section and 312000 “Earthmoving”.

B. Contractor shall propose three (3) aggregate surfacing mixtures utilizing aggregate materials from the proposed source quarry. Mixtures shall vary in fines content and be designed to produce a firm and stable trail surface.

C. Contractor shall submit proposed gradation and Plasticity Index for each test section prior to installation.

D. Test sections shall be compacted using the same equipment, lift thickness, moisture conditioning, and compaction procedures for the Work.

E. State Representative will evaluate firmness, stability, appearance, drainage characteristics, and resistance to raveling following compaction and wetting.

F. Approved test section shall serve as the standard for color, texture, gradation, compaction, and appearance of the completed work.

PART 2 – PRODUCTS

2.1 AGGREGATE BASE COURSE

A. CalTrans 3/4” maximum, Class 2 aggregate base material. Fractured natural rock only without recycled asphalt, concrete or other reclaimed material.

1. Matrix: 100% passing 1” screen, 90-100% passing ¾” screen, 35-60% passing No. 4 screen, 10-30% passing No. 30 screen, 2-9% passing No. 200 screen.

2. Free of organic material and invasive or noxious seeds.

2.2 AGGREGATE TOP COURSE

A. Provide quarry-produced mix of Aggregate Top Course material with Fines to achieve performance requirements specified herein.

B. Aggregate Product: Natural 3/4” minus aggregate with fractured faces from single-source, open-pit quarry without recycled asphalt, concrete or other reclaimed material.

1. Matrix: 100% passing 1” screen, 87-100% passing 3/4” screen, 70-85% passing ½” screen, 30-65% passing No. 4 screen, 5-35% passing No. 30 screen, 0-12% passing No. 200 screen.

2. Free of organic material and invasive or noxious seeds.

C. Plasticity Requirements: Plasticity index range shall be established by evaluation of test sections described herein. Provide sufficient fines to achieve a firm and stable surface.

1. Excessively plastic materials are prohibited.

2. Plasticity index shall not exceed 12.

D. Fines: Material passing No. 200 screen to be used in final, approved top course mix.

1. Fines shall be obtained from approved source quarry.

2. Free of organic material and invasive or noxious seeds.

PART 3 – EXECUTION

3.1 SUBGRADE PREPARATION

A. State Representative shall approve all staking prior to installation of aggregate paving.

B. Prior to installing the aggregate paving, areas to receive aggregate shall be shaped to reflect the same linear grade and cross slopes as the desired finished surface.

C. Subgrade surface shall be graded to within 0.05 foot of finish grade minus paving thickness.

D. Uniformly moisture-condition the top six (6) inches of paving area subgrade to equal or above optimum moisture content prior to compaction operations.

E. The subgrade shall be uniformly smooth and compacted to meet or exceed 90% relative compaction.

1. Fill and compact any depressions and remove loose material to finish true to line and grade, presenting a smooth, compacted and unyielding surface.

F. Proof-roll subgrade with a loaded pneumatic-tired vehicle or similar equipment to verify stability of subgrade. Correct deficient conditions before proceeding with placement of aggregate base.

3.2 INSTALLATION OF AGGREGATE SURFACE

A. Confirm edge retention is installed where indicated in the contract drawings. Deficient conditions shall be corrected before proceeding with installation of base course.

B. General: Construction procedures described in Caltrans Section 26 “Aggregate Bases” apply to this Work.

1. Aggregate surface shall consist of one 3-inch aggregate base course lift and one 3-inch aggregate top course lift. Each lift shall be compacted. The final paving section shall be six (6) inches thick.

a. The finished surface shall be smooth and even both linearly and laterally.

b. The finished surface shall be firm and stable.

c. No additive stabilizer or binder products are allowed.

2. Aggregate shall be kept moist to achieve maximum rate of compaction.

3. Compact each lift to a minimum 95% per California Test 231.

C. Uniformly spread aggregate base course over the prepared subgrade and compact in a separate 3-inch lift.

D. Uniformly spread approved aggregate top course over aggregate base and compact in a separate 3-inch lift.

3.3 TOLERANCES

A. Finished surface smoothness: Maximum 1 inch in 10 feet any direction.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: The Contractor shall engage a qualified geotechnical engineering testing firm to perform, subgrade, moisture and compaction tests related to this work at Contractor's expense.

1. Testing procedures for wet density, moisture content, and relative compaction shall be in accordance with California Test 231

2. Provide test reports to State Representative for verification.

B. Allow the testing firm to inspect and test subgrades and each fill layer. Proceed with subsequent base placement only after test results for previously completed work comply with requirements.

C. When testing indicates specified moisture content or relative compaction has not been achieved, the Contractor shall repair, moisten, scarify and replace material to depth required, recompact and retest until specified performance is obtained.

3.5 ACCEPTANCE

A. Finished surface shall be firm, stable, uniformly compacted, and free of loose aggregate, rutting, pumping, erosion, or displacement.

B. Prior to Final Acceptance, repair settlement, erosion, raveling, and surface irregularities and recompact as required to provide specified surface condition.

END OF SECTION 327770

SECTION 328400

IRRIGATION SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION

A. Work included: Order and furnish all labor, materials, supplies, tools and transportation and perform all operations in connection with and reasonably incidental to complete installation of the automatic sprinkler irrigation systems as shown on the drawings. Items hereinafter are included as an aid to take off and are not necessarily a complete list of work items.

1. Trenching, stockpiling, excavation, backfill materials and refilling trenches.

2. Furnishing materials and installation for complete system including piping, backflow prevention assembly, valves, fittings, sprinkler heads, automatic controls and final adjustment of heads to insure complete and uniform coverage.

3. Line voltage connections to the irrigation controllers and low voltage control wiring from controllers to remote control valves.

4. Replacement of unsatisfactory materials.

5. Clean-up, inspection and approval.

6. All work of every description mentioned in the specification and/or addenda thereto, and all other labor, and materials reasonably incidental to the satisfactory completion of the work, including clean-up of the site, as directed by the Architect.

7. Tests.

8. Record drawings.

B. Work not included:

1. Irrigation water stub-out./meter.

2. 120 volt A.C. electrical stub-out to controller location.

1.02 GENERAL REQUIREMENTS

A. OSHA Compliance: All articles and services covered by this specification shall meet or exceed the safety standards established under the Federal Occupational Safety and Health Act of 1970, together with all amendments in effect as of the date of this specification.

B. Codes and Standards: Comply with all applicable codes and standards.

1. All work and materials shall be in full accordance with the latest rules and regulations of the National Electric Code; the Uniform Plumbing Code, published by the Western Plumbing Officials Association; and other State or local laws or regulations. Nothing in these Drawings or Specifications is to be construed to permit work not conforming to these codes.

2. When the Specifications call for materials or construction of a better quality or larger size than required by above-mentioned rules and regulations, the provision of the Specifications shall take precedence over the requirements of the said rules and regulations.

3. The Contractor shall furnish without any extra charge any additional material and labor when required by the compliance with these rules and regulations, though the work may not be mentioned in these particular Specifications or shown on the Drawings.

4. The Contractor shall erect and maintain barricades, guards, warning signs, and lights as necessary or required by OSHA regulations for the protection of the public or workers.

5. Any existing buildings, equipment, piping, pipe covering sewers, sidewalks, landscaping, etc., damaged by the Contractor during the course of this work shall be replaced or repaired by the Contractor in a manner satisfactory to Architect and at Contractor's expense, and before final payment is made. The Contractor shall be responsible for damage caused by leaks in the piping systems being installed or having been installed by him. He shall repair, at his own expense, all damage so caused, in a manner satisfactory to Architect.

6. The Contractor shall pay for all permits, licenses, and fees required.

1.03 SUPERVISION AND WORKMANSHIP

A. The Contractor, personally or through an authorized and competent representative, shall supervise the work constantly, and shall as far as possible keep the same foreman and workers on the job from commencement to completion. The workmanship of the entire job must in every way be first class, and only experienced and competent workers will be allowed on the job.

1.04 LAYOUT OF WORK

A. The Contractor shall stake out the irrigation system as shown on the Drawings. These areas shall be checked by the Contractor and Architect before construction is started. Any changes, deletions or additions shall be determined at this check.

1.05 INSTRUCTION

A. After the system has been installed and approved, Contractor shall instruct the Owner's Representative in complete operation and maintenance of the irrigation system.

1.06 SUBMITTAL

A. Submit catalog information on all materials which are to be used in the installation. Product and specified options must be highlighted on the catalog information. No substitution will be permitted without prior written approval by the Irrigation Consultant. Complete submittal approval must be obtained prior to construction.

B. Record Drawings:

1. The Contractor shall maintain in good order in the field office one complete set of black line prints of all sprinkler drawings which form a part of the contract, showing all water lines, sprinklers, valves, controllers and stub-outs. In the event any work is not installed as indicated on the Drawings, such work shall be corrected and dimensioned accurately from the building walls.

2. All underground stub-outs for future connections and valves shall be located and dimensioned accurately from building walls on all record drawings.

3. Upon completion of the work, obtain reproducible prints from Architect and neatly correct the prints to show the as-built conditions.

PART 2 MATERIALS

2.01 PIPE AND FITTINGS

A. Mainlines (constant pressure) shall be PVC 1120-Schedule 40 plastic pipe.

1. Join lengths of pipe by means of Schedule 40 PVC solvent weld couplings on Schedule 40 pipe.

2. At changes in direction or branch mains, use appropriate Schedule 40 PVC solvent weld fittings as approved by the Uniform Plumbing Code.

B. Lateral lines (non-pressure) shall be 1120-Schedule 40 PVC plastic pipe. All lateral lines shall be connected with Schedule 40, Type 1, Grade 1, PVC solvent weld fittings.

C. Connections between mainlines and RCVs shall be of Schedule 80 PVC (threaded both ends) nipples and fittings.

D. Risers shall be as follows: Schedule 80 PVC threaded nipples and Schedule 40 PVC ells as shown in the construction details. Offset risers shall be NDS

model FR-500 flex-risers.

2.02 BACKFLOW PREVENTION DEVICE

A. Backflow prevention device shall be the reduced pressure type with gate valves, check valves, test cocks, reduced pressure chamber and air vent. Install 12" above finish grade.

2.03 FLOW SENSOR

A. Flow sensor shall be Creative Sensor Technology as listed on the Drawings.

2.04 GATE VALVES

A. 2 1/2" and smaller shall be bronze construction with operating wheel and screwed connections. 3" and larger shall be ductile iron with operating nut (2" square) and "O" ring connections for PVC plastic pipe. Install in 10" diameter plastic valve box as detailed.

2.05 QUICK COUPLING VALVES

A. Quick coupling valve shall be as listed on the Drawings.

2.06 REMOTE CONTROL VALVES

A. Remote control valves shall be globe/angle pattern with brass / bronze / plastic / ductile iron body and bonnet, brass/plastic flow stem and manual bleed petcock. Sizes of remote control valves shall be as listed on the Drawings.

2.07 BOXES FOR REMOTE CONTROL VALVES

A. Rain Bird VB black plastic valve box with black plastic lid. Lid shall be marked: "Irrigation Control Valve".

2.08 CONTROLLER

A. Controller shall be as listed on the Drawings.

2.09 CONTROL WIRE

A. Control wire shall be copper with U.L. approval for direct burial in ground, size #14-1. Common ground wire shall have white insulating jacket; control wire shall have insulating jacket of color other than white. Splices shall be made with 3M DBR/Y-6 Scotchlok seal packs.

2.10 WEATHER SENSOR

A. Weather sensor shall be Hunter Wireless Solar Sync weather sensing device compatible with irrigation controller.

2.11 SPRINKLER HEADS

A. All sprinkler heads shall be as listed on the Drawings.

2.12 MISCELLANEOUS INSTALLATION MATERIALS

A. Low VOC solvent cement and primer for solvent weld joints shall be of make and type approved by manufacturer(s) of pipe and fittings. Cement shall be maintained at proper consistency throughout use.

B. Pipe joint compound shall be non-hardening, non-toxic materials designed specifically for use on threaded connections in water carrying pipe. Performance shall be same as Permatex No. 51.

2.13 MISCELLANEOUS EQUIPMENT

A. Provide all equipment called for by the Drawings.

B. Provide to the Owner, at completion of Maintenance Period, three (3) each of all operating and servicing keys and wrenches required for complete maintenance and operation of all heads and valves. Include all wrenches necessary for complete disassembly of all heads and valves.

PART 3 INSTALLATION

3.01 PREPARATION

A. Schedule and coordinate placement of materials and equipment in manner to effect the earliest completion of work in conformance with construction and progress schedule.

3.02 HANDLING AND STORAGE

A. Protect work and materials from damage during construction and storage as directed by Architect.

B. Handle plastic pipe carefully; especially protect it from prolonged exposure to sunlight.

3.03 LAYOUT

A. Lay out work as accurately as possible in accordance with diagrammatic drawings.

B. Where site conditions do not permit location of piping, valves and heads where shown, notify Architect immediately and determine relocation in joint conference.

C. Run pipelines and automatic control wiring in common trenches wherever practical.

3.04 EXCAVATION AND TRENCHING

A. Excavation shall be in all cases ample in size to permit the pipes to be laid at the elevations intended and to permit ample space for joining.

B. Make trenches for pipelines deep enough to provide minimum cover from finish grade as follows:

1. 18" minimum cover over mainlines to control valves and quick coupling valves.

2. 18" minimum cover over control wires from controller to valves.

3. 12" minimum cover over RCV controlled lateral lines to sprinkler heads or other irrigation methods.

C. Restore surfaces, existing underground installations, etc., damaged or cut as a result of excavations, to original conditions in manner approved by Architect.

D. Where other utilities interfere with irrigation trenching and pipe work, adjust the trench depth as instructed by Architect.

3.05 ASSEMBLING PIPELINES

A. All pipe shall be assembled free from dirt and pipe scale. Field cut ends shall be reamed only to full pipe diameter with rough edges and burrs removed.

B. Solvent Weld Joint:

1. Prepare joint by first making sure the pipe end is square, then deburring the pipe end and cleaning pipe and fitting of dirt, dust and moisture.

2. Dry-insert pipe into fitting to check for missizing. Pipe should enter fitting 1/3 to 2/3 depth of socket.

3. Coat the inside socket surface of the fitting and the fitting and the male end of the pipe with P-70 primer (manufactured by Weld-On). Then without delay, apply Weld-On 711 cement liberally to the male end of the pipe and also apply Weld-On 711 cement lightly to the inside of the socket. At this time, apply a second coat of cement to the pipe end.

4. Insert pipe immediately into fitting and turn 1/4 turn to distribute cement and remove air bubbles. The pipe must seat to the bottom of the socket and fitting. Check alignment of the fitting. Pipe and fitting shall

be aligned properly without strain to either.

5. Hold joint still for approximately thirty (30) seconds and then wipe the excess cement from the pipe and fitting.

6. Cure joint a minimum of thirty (30) minutes before handling and at least six (6) hours before allowing water in the pipe.

C. Threaded Joint:

1. Field threading of plastic pipe or fittings is not permitted. Factory-formed threads only will be permitted.

2. Factory-made nipples shall be used wherever possible. Field-cut threads in metallic pipe will be permitted only where absolutely necessary. When field threading, cut threads accurately on axis with sharp dies.

3. All threaded joints shall be made up with pipe joint compound. Apply compound to male threads only.

4. Where assembling metallic pipe to metallic fitting or valve, no more than three (3) full threads shall show when joint is made up.

5. Where assembling to threaded plastic fitting, take up joint no more than one full turn beyond hand tight.

6. Where assembling plastic pipe, use strap type friction wrench only; do not use metal-jawed wrench.

D. Cap or plug openings as pipeline is assembled to prevent entrance of dirt or obstructions. Remove caps or plugs only when necessary to continue assembly.

E. Where pipes or control wires pass through sleeves, provide removable non-decaying plug at ends of sleeve to prevent entrance of earth.

3.06 REMOTE CONTROL VALVES

A. Install where shown on Drawings and group together where practical. Limit one remote control valve per box--No Exceptions.

B. Locate valve boxes 12" from and perpendicular to walk edges, buildings and walls. Provide 12" between valve boxes where valves are grouped together.

C. Thoroughly flush mainline before installing valve.

D. Install in shrub or ground cover areas where possible.

E. Label control line wire at each valve with a 2 1/4" x 3/4" polyurethane I.D. tag, indicating identification number of valve (controller and station number). Attach label to control wire.

3.07 AUTOMATIC CONTROL WIRE

A. Run lines along mains wherever practical. Tie wires in bundles with pipe wrapping tape at 10' intervals and allow slack for contraction between strappings.

B. Loop a minimum of three (3) feet of extra wire in each valve box; both control wire and ground wire.

C. Connections shall be made by crimping bare wires with brass connectors and sealing with 3M DBR/Y-6 sealer packs.

D. Splicing will be permitted only on runs exceeding 2500'. Locate all splices at valve locations within valve boxes.

E. Where control lines pass under paving, they shall pass through Schedule 40 electrical PVC conduit.

3.08 AUTOMATIC CONTROLLER

A. Provide and install automatic irrigation controller in approximate locations shown on Drawings. The exact location will be determined on the site by Architect. Provide conduit and wire and connect to 120 volt switch accessible to controller for ease of maintenance.

B. Connect control lines to controller in sequential arrangement according to assigned identification number of valve. Each control line wire shall be labeled at controller with a permanent non-fading label indicating station number of valve controlled. Attach label to control wire.

3.09 SPRINKLER HEADS AND QUICK COUPLING VALVES

A. Thoroughly flush lines before installing heads or QCVs.

B. Locate heads and QCVs as shown in the Drawings and Details.

C. Adjust sprinkler heads for proper distribution and trim.

3.10 TESTING

A. Perform test as specified below. Remake any faulty joints with all new materials. Use of cement or caulking to seal leaks is absolutely prohibited.

The Contractor shall:

1. Notify Architect at least three (3) days in advance of testing.

2. Perform testing at his own expense.

3. Center load piping with small amount of backfill to prevent arching or slipping under pressure. No fitting shall be covered.

4. Apply the following tests after weld plastic pipe joints have cured at least 24 hours.

   a. Test live (constant pressure) and QCV lines hydrostatically at 125 PSI minimum. Lines will be approved if test pressure is maintained for six (6) hours. The line will be approved or not approved as such results may indicate. The Contractor shall make tests and repairs as necessary until test conditions are met.

   b. Test RCV controlled lateral lines with water at line pressure and visually inspect for leaks. Retest after correcting defects.

3.11 BACKFILLING

A. Backfill only after piping has been tested, inspected and approved.

B. Backfill material shall be the earth excavated from the trenches, free from rocks, concrete chunks, and other foreign or coarse materials. Carefully select backfill that is to be placed next to plastic pipe to avoid any sharp objects which may damage the pipe.

C. All pipe under asphalt paving shall be backfilled with 4" of clean sand on all sides of pipe.

D. Place backfill materials in 6" layers and compact by jetting or tamping to a minimum compaction of 90 percent of original soil density.

E. Dress off areas to finish grades and remove excess soil, rocks or debris remaining after backfill is completed.

F. If settlement occurs along trenches, and adjustments in pipes, valves and sprinkler heads, soil, sod or paving are necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, the Contractor, as part of the Work under this contract, shall make all adjustments without extra cost to the Owner.

3.12 GUARANTEE

A. It shall be the responsibility of the Contractor to fill and repair all depressions and replace all necessary lawn and planting due to the settlement of irrigation trenches for one year following completion and acceptance of the job.

B. The Contractor shall also guarantee all materials, equipment and

workmanship furnished by him to be free of all defects of workmanship and materials, and shall agree to replace at his expense, at any time within one year after installation is accepted, any and all defective parts that may be found.

3.13 CLEAN-UP

A. When work of this section has been completed and at such other times as may be directed, remove all trash, debris, surplus materials and equipment from site.

END OF SECTION 328400

SECTION 330505.31

HYDROSTATIC TESTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Hydrostatic Testing of Potable Water Systems.

B. Related Sections include but are not necessarily limited to:

1. None.

1.2 MEASUREMENT AND PAYMENT

A. The contract lump sum price shall include full compensation for all costs and work involved with pipe testing, repair, and retesting.

1.3 REFERENCES

A. American Society of Mechanical Engineers (ASME):

1. B40.100 – Pressure Gauges and Gauge Attachments.

B. American Water Works Association/American National Standards Institute (AWWA/ANSI):

1. C600 – Standard for Installation of Ductile-Iron Water Mains and other Appurtenances.
2. C651 – Disinfecting Water Mains.

1.4 DEFINITIONS

A. Exposed Piping:

1. Piping installed above ground outside or above finished floor in buildings, structures, vaults, galleries, or concrete trenches.

B. Buried Piping:

1. Piping directly backfilled or concrete encased below finished grade or beneath structures.

C. Submerged Piping:

1. Piping placed below the high water level of a tank or basin. See the requirements for buried piping for piping placed below groundwater level.

1.5 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for general submittal requirements and content.

B. Informational Submittals:

1. Quality Assurance/Control:

a. Test reports:

1) Copies of pressure test results on all piping systems.

a) Include the time and date for test and any retests, pipe material, segment of pipeline tested, leaks revealed, and repairs made.

1.6 QUALITY ASSURANCE/CONTROL

A. Certifications:

1. Perform pressure test using calibrated pressure gages and calibrated volumetric measuring equipment to determine leakage rates. Use test gages conforming to ASME B40.100 and accuracy of 1 percent of full range.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PREPARATION

A. Coordinate and schedule witnessed testing with Deputy State Fire Marshal.

B. Install temporary vents, drains, restraints, bulkheads, and thrust blocking where required to conduct tests. Vents and drains shall be rated for the test pressure. Remove and plug vent and drain connections after tests are completed. Restraints and bulkheads shall be sized for no less than 2 times the specified test pressure.

3.2 APPLICATION

A. General:

1. Notify the Engineer 24-hours prior to each test.
2. Use pressures, media, and pressure test durations as specified in Piping Specification Schedule unless otherwise noted in the pipe specification sections.
3. Select each pressure gage so that the specified test pressure falls within the upper half of the gage's range.
4. Isolate equipment, devices, or analyzers that may be damaged by the specified pressure test pressure or media.
5. Do not test against closed valves that are not rated for the testing media or pressure, or that is not restrained.
6. Add valves at high points as required to purge all air from pipes.
7. Restrain pipe and appurtenances as needed to conduct test in a safe manner.
8. Completely assemble and test new piping systems prior to connection to existing pipe systems. Provide temporary fitting as needed to isolate the new pipe and conduct the test.
9. Acknowledge satisfactory performance of tests and inspections in writing to Engineer prior to final acceptance.

B. Testing Medium:

1. Unless otherwise specified, use the following test media for air systems:

PIPE SIZE	MEDIUM	TEST PRESSURE
2” and smaller	Air or water	75-psi or less
2” and smaller	Water	Greater than 75-psi
Greater than 2”	Air or water	3-psi or less
Greater than 2”	Water	Greater than 3-psi

1. Unless otherwise specified, use the following test media for liquid systems:

SYSTEM TYPE & SIZE	MEDIUM	TEST PRESSURE
Gravity, ≤48”	Air or water	25-psi
Pressure, All Sizes	Water	[**200**]-psi

C. Cleaning:

1. Flush pipes to be tested with water using a minimum velocity of 3-fps.

D. Exposed Piping:

1. Test exposed, non-insulated piping systems upon completion of system.
2. Test exposed, insulated piping systems upon completion of system but prior to application of insulation.
3. Test concealed interior piping systems prior to concealment and, if system is insulated, prior to application of insulation.
4. Fill pipe with water and remove all air before conducting test.
5. Maintained specified test pressure for a minimum of 4-hours unless otherwise noted in the pipe specification sections.

E. Buried Piping:

1. Test buried piping after thrust blocks obtained their design strength and backfilling has been completed. Test pipe 12-inches in diameter and smaller in segments no longer the 1,200-feet. Test pipes larger the 12-inches in segments no longer than 1-mile.
2. Maintain test pressure during test by adding water. The water allowance shall be in accordance with AWWA C600.

F. Allowable Leakage Rates:

1. All hydrostatically pressure tested pipes shall have zero leakage at the specified test pressure throughout the duration of the test.
2. All pipes tested with high-pressure air shall have zero leakage.
3. For pipes tested with low pressure air (less than 25-psig) the acceptable time for loss of 1-psig of air pressure shall be:

PIPE SIZE (IN DIA)	TIME, MINUTES/100 FT
4	0.3
6	0.7
8	1.2
10	1.5
12	1.8
15	2.1
18	2.4
21	3.0
24	3.6
27	4.2
30	4.8
33	5.4
36	6.0
42	7.3
48	7.6

G. Water testing methodology:

1. All joints, including welds, are to be left exposed for examination during the test.
2. Provide temporary restraints for expansion joints for additional pressure load under test.
3. Do not paint or insulate exposed piping until successful performance of pressure test.
4. Measure test pressure at the lowest point in the piping system.
5. Disinfect potable water pipelines after pressure testing.

H. Air testing methodology:

1. Low pressure air testing (≤25-psig):

   a. Place plugs in line, inflate to 25-psig, and check pneumatic plugs for proper sealing.
   b. Slowly introduce low-pressure air into sealed line segment until air pressure reaches 4-psig greater than ground water that may be over the pipe.
   c. Allow 2 minutes for air pressure to stabilize.
   d. After stabilization period (3.5-psig minimum pressure in pipe) discontinue air supply to line segment.
   e. Record pressure at beginning and end of test.

2. High Pressure air testing (>25-psig):

   a. Inflate pipe to 25-psig and examine for leaks and proper sealing.
   b. Gradually increase to test pressure and maintain for the specified duration.

I. Pressure Testing of Double-Containment Piping:

1. Test the primary pipe or tubing as described for buried and aboveground or exposed piping.
2. Test the secondary containment piping by performing a pneumatic test as described above of the annular space between the primary and secondary pipes at a pressure of 5-psi.

3.3 REPAIR

A. Repair all leaks and re-test pipes until successful pressure tests are achieved at no additional cost to DPR.

3.4 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. Lawfully dispose of the chlorinated water.

END OF SECTION

SECTION 33 05 31

PLASTIC PIPE

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. PVC pipe, fittings, and appurtenances.

B. Related Sections include but are not necessarily limited to:

1. Section 31 23 33 – Trenching and Backfilling
2. Section 33 05 05.31 – Hydrostatic Testing

1.2 REFERENCES

A. Referenced Standards:

1. ASTM International (ASTM):

a. D1784 – Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
b. D1785 – Standard Specification for Poly(Vinyl Chloride) PVC Plastic Pipe, Schedules 40, 80 and 120.
c. D2241 – Standard Specification for Poly(Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series).
d. D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications.
e. D2467 – Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
f. D2564 – Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems
g. D3034 – Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings.
h. D3139 – Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals.
i. D3212 – Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals
j. F477 – Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe.

k. F493 – Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
l. F593 – Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
m. F679 – Standard Specification for Poly (Vinyl Chloride) (PVC) Large-Diameter Plastic Gravity Sewer Pipe and Fittings.
n. F794 – Standard Specification for Poly(Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe and Fittings Based on Controlled Inside Diameter
o. F949 – Standard Specification for Poly(Vinyl Chloride) (PVC) Corrugated Sewer Pipe With a Smooth Interior and Fittings

2. NSF International (NSF).

1.3 SUBMITTALS

A. See Section 01 33 00 – Submittal Procedures for general submittal requirements and content.

B. Action Submittals:

1. Product Data:

a. Acknowledgement that products submitted meet requirements of standards referenced.
b. Solvent cement Manufacturer's product information confirming compliance reference standards for each fluid service.
c. Certification of factory hydrostatic testing.

PART 2 – PRODUCTS

2.1 WATER SERVICE

A. General:

1. Manufacture pipe, fittings, and valves from materials that have been tested and approved by the NSF for conveying potable water.

B. Pipe (3-inch and smaller):

1. Schedule [80], Type 1, Grade 1 PVC pipe meeting requirements of ASTM D1784 and D1785.
2. Pipe 2-inch and less to be solvent welded. Pipe larger than 2-inch may be either flanged or solvent welded unless otherwise shown on Drawings.
3. Fittings:

a. Schedule [80], Type 1, Grade 1 socket-type fittings in accordance with ASTM D2467 having the same pressure and temperature rating as the pipe.

4. Flanges and Unions:

   a. Provide either flanges or unions at valves, penetrations through structures, and equipment connections.
   b. Flanges:

      1) One-piece 150-lb socket-type PVC flanges conforming to the dimensions of ASME B16.5, Class 150.
      2) Use spacers supplied by pipe manufacturer when mating raised-faced flanges to other flanges.
      3) Nuts and bolts per manufacturer requirements

   c. Unions:

      1) Schedule [80] Type 1, Grade 1, PVC socket-type union with EDPM O-rings in accordance with ASTM D1784.

5. Gaskets:

   a. Per pipe manufacturer's recommendations.

6. Flexible Connections:

   a. Provide flexible Schedule [80] PVC pipe at locations shown on the Drawings for pipe flexibility and expansion/contraction purposes.

7. Solvent Primer:

   a. NSF-61 compliant, industrial grade, solvent in accordance with ASTM F656.

      1) Acceptable Products: IPS Weld-On P-70, Engineered Products EP50, or approved equal.

8. Solvent Cement:

   a. Rigid Pipe:

      1) NSF-61 compliant, heavy body cement in accordance with ASTM D2564.
      2) Acceptable Products: IPS Weld-On 711, Engineered Products EP11, or approved equal.

   b. Flexible Pipe:

1) NSF-61 compliant, medium body cement in accordance with ASTM D2564.
2) Acceptable Products: IPS Weld-On 795 or approved equal.

2.2 WATER MAINS (4 to 12-inch):

A. Pipe: AWWA C900 PVC with integral bell and spigot joints made from cell class 12454 as defined in ASTM D1784 complying with NSF-61.

B. Pressure Class: SDR 14, Pressure Class 305-psi

C. Fire Mains: DR-14, Pressure Class 200, FM/UL listed.

D. Color: Blue

E. Joints: ASTM D3139 with elastomeric gaskets installed.

F. Restraints: C900 uses ductile fittings.

G. Fittings:

1. Restrained ductile iron fittings in accordance with AWWA C110 and C153 with pressure rating to be equal or greater than pipe and lined to a minimum thickness of 40-mils with NSF-61 epoxy in accordance with AWWA C210.

H. Gaskets: Elastomeric conforming to ASTM F477.

2.3 GRAVITY STORM DRAIN AND SEWER

A. Material: PVC cell classification 12454B or 12364C in accordance with ASTM D1784.

B. Color: Green

C. Sizes 4 to 15-inches: SDR [35] conforming to ASTM D3034.

D. Joints: Push-on with integral bell and factory-installed gasket in accordance with ASTM D3212.

E. Gaskets: Vulcanized high-grade elastomeric compound conforming to ASTM F477. Provide natural rubber, synthetic elastomer, or a blend of both that is water soluble, non-toxic, non-supporting of bacteria growth, having no deteriorating effect on PVC or rubber gaskets. No solvent-cement weld pipe or fittings will be accepted

F. Use lubricant for assembly in accordance with the manufacturer's recommendations that has no detrimental effect on the gasket or on the pipe.

PART 3 – EXECUTION

3.1 GENERAL

A. Store and support pipe and fittings on site in accordance with the manufacturer's instructions.

B. Do not use pipe or fittings that are scratched, cracked, gouged, or discolored.

C. Do not install PVC pipe when ambient temperature is below 40 °F or above 90°F.

D. Field threading plastic pipe will not be permitted; Use factory-molded socket by threaded adapters.

3.2 INSTALLATION

A. Solvent Welding:

1. Cut pipe square, remove all burrs, and clean and dry the inside and outside of the pipe and fittings. Prime the end of the pipe and inside of sockets in accordance with manufacturer's instructions. Apply cement to end of pipe and inside of socket and join in accordance with ASTM D2855. Allow to dry in accordance with Manufacturer's instructions before pressurizing the system.

B. Install pipe and supports in compliance to the manufacturer's instructions.

1. Exposed piping:

a. Support exposed piping as shown on the drawings and in accordance with Section 40 05 07 – Pipe Hangers and Supports. Continuously support plastic piping at liquid operating temperatures in excess of 100°F. For vertical piping, band the pipe at intervals to rigidly support load of twice vertical load. Support riser clamps on spring hangers.
b. Do not clamp plastic pipe tightly or restrict movement for expansion and contraction.

2. Buried Piping:

a. Place buried plastic pipe in accordance with ASTM D2774. 'Snake' pipe in trench to allow for expansion and contraction. Do not backfill until joints have fully cured.

C. Unions:

1. Joints: Restrain with solvent cement. Do not used threaded pipe.
2. Solvent Cement: ASTM D2564

D. Warning Tape:

1. General: Non-detectable 3-inch warning tape made of solid blue film with continuously printed black-letter message reading “CAUTION—(insert utility type here) LINE BURIED BELOW.” Install tape approximately 1-foot above and along the centerline of the pipe. Where tape is not continuous, lap tape ends a minimum of 2-feet.

E. Tracer Wire:

1. General: Minimum #12 AWG stranded copper wire with color per utility type THW, THWN, or THHN rated insulation.
2. Install on trench bottom under the vertical projection of the pipe to protect it in all installations.
3. 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 State, terminate the 12-inch wire lead inside the enclosure.
4. 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.

F. Coatings:

1. Coat pipe in accordance with manufacturer’s recommendations where schedule to be painted.

G. Disinfecting:

1. Disinfect pipe in accordance with Section 33 05 05.31.

H. Labeling:

1. Label exposed process pipes in accordance with State’s requirements. Do not label building plumbing (potable hot and cold water pipes) and irrigation pipes.

3.3 FIELD TESTS

A. Hydrostatic Testing:

1. Pressure test piping system in accordance with Section 33 05 05.31 – Hydrostatic Testing.

END OF SECTION

SECTION 33 14 19

VALVES AND HYDRANTS

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gate Valves
2. Dry Barrel Fire Hydrants
3. Wet barrel Fire Hydrants
4. Wharf Hydrants
5. Hose Valves
6. Non-Freeze Yard Hydrants
7. Hose Bibs
8. Fill Stations
9. Sample Stations
10. Corporation Stops
11. Curb Stops
12. Quick Connection Valves
13. Valve Boxes

B. Related Sections include but are not necessarily limited to:

1. Section 33 05 05.31 – Hydrostatic Testing.
2. Section 31 05 33 – Trenching, Backfill, and Compaction

1.2 REFERENCES

A. Definitions:

1. Lead-Free: A weighted average lead content ≤0.25%.
2. OS&Y: Outside Screw and Yoke.
3. NRS: Non-rising Stem.
4. RS: Rising Stem.
5. CWP: Cold water working pressure.
6. SWP: Steam working pressure.
7. WOG: Water, oil, gas working pressure.
8. WWP: Water working pressure.
9. Exposed Valves:

    a. Valves installed above ground outside or above finished floor in buildings, structures, vaults, galleries, or concrete trenches.

10. Buried Valves:

a. Valves directly backfilled below finished grade or beneath structures.

11. Submerged Valves:

a. Valves placed below the high-water level of a tank or basin. See the requirements for buried valves for valves placed below groundwater level.

B. Referenced Standards:

1. American Society of Mechanical Engineers (ASME):

a. B1.1 – Unified Inch Screw Threads (UN and UNR Thread Form).

2. Manufacturers Standardization Society of the Valve and Fittings Industry Inc. (MSS):

a. SP-9 – Spot Facing for Bronze, Iron and Steel Flanges.
b. SP-70 – Cast Iron Gate Valves, Flanged and Threaded Ends.
c. SP-80 – Bronze Gate, Globe, Angle and Check Valves.

3. ASTM International (ASTM):

a. B62 – Standard Specification for Composition Bronze or Ounce Metal Castings
b. B695 – Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.

4. American Water Works Association (AWWA):

a. C105 – Polyethylene Encasement for Gray and Ductile Cast Iron Piping for Water and Other Liquids.
b. C207 – Standard for Steel Pipe Flanges for Waterworks Service – Sizes 4 IN through 144 IN.
c. C502 – Dry Barrel Fire Hydrants
d. C503 – Wet Barrel Fire Hydrants
e. C515 – Reduced-Wall, Resilient Seated Gate Valves for Water Supply Service
f. C550 – Protecting Epoxy Interior Coating for Valves and Hydrants
g. C600 – Installation of Ductile Iron Water Mains and Their Appurtenances.
h. C800 – Underground Service Line Valves and Fittings
i. M17 – Installation, Operation and Maintenance of Fire Hydrants.

5. National Fire Protection Association (NFPA)

a. NFPA 24 – Standard for the Installation of Private Fire Service Mains and their Appurtenances.
b. NFPA 1963 – Standard for Fire Hose Connections.

6. National Sanitation Foundation:

a. NSF 61 (latest edition) – Drinking Water System Components - Health Effects.

1.3 SUBMITTALS

A. See Section 01 33 00 - Submittal Procedures for general submittal requirements and content.

B. Action Submittals:

1. Product Data:

a. Acknowledgement that products submitted meet requirements of standards referenced.
b. Manufacturer's latest published literature including:

1) Materials of construction
2) Pressure and temperature rating.
3) Dimensions and weight.
4) Parts diagram and list.

c. Warranty

2. Quality Assurance/Control:

a. Certificates:

1) Submit Statement of Compliance, supporting data, from material suppliers attesting that valves and accessories provided meet or exceed AWWA Standards and specification requirements including conformance to the latest edition of NSF 61.
2) All wetted brass and bronze components shall comply with §116875 of the California Health & Safety Code requirements for lead content.

1.4 QUALITY ASSURANCE/CONTROL

A. Regulatory Requirements:

1. All wetted brass and bronze components shall comply with §116875 of the California Health & Safety Code requirements for lead content.

2. All components in contact with potable water shall be certified NSF-61 and 372 or equal.

B. Qualifications:

1. Company specializing in manufacturing products specified in this section with a minimum 5-years' experience.

1.5 DELIVERY, STORAGE AND HANDLING

A. Seal ends of valves and fire hydrants for shipment to prevent entry of foreign matter into body.

1.6 WARRANTY

A. Fire Hydrants:

1. Provide a 10-year full parts and labor warranty against defects in material and workmanship under normal usage commencing from the date the assembly is placed into service.

B. Fill Stations:

1. Provide a 1-year parts warranty against defects in material and workmanship under normal usage commencing from the date the assembly is placed into service.

1.7 MAINTENANCE MATERIALS

A. Provide maintenance manuals in accordance with Section 01 78 23.

B. Furnish one tee wrench to Park for buried valves with nut operators.

PART 2 – PRODUCTS

2.1 GATE VALVES

A. 3-inches and Smaller (Bronze)

1. Materials:

a. Body, bonnet, and wedge: Lead-free bronze.
b. Stem: Silicon bronze.
c. Packing: Teflon
d. Handwheel: Malleable or Cast Iron.

2. Design Requirements:

a. Class 125 bronze full-port gate valve.

b. Comply with MSS SP-80.
c. 200-psi non-shock Water, Oil, Gas (WOG).Working Pressure
d. Screw in bonnet, non-rising stem, solid wedge.

3. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Nibco, 113-LF.
b. Milwaukee, UP 105
c. Watts, LFGV.
d. Matco-Norca, 511 LF.
e. Or equal.

B. 3-inches and Smaller (Stainless)

1. Materials:

a. Body, bonnet, stem, gland, and wedge: Stainless steel.
b. Packing and seal: PTFE
c. Handwheel: Aluminum.

2. Design Requirements:

a. Class 200 full-port gate valve.
b. 200-psi non-shock Water, Oil, Gas (WOG) working pressure
c. Screw in bonnet, non-rising stem, solid wedge.

3. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Dixon.
b. Ohio Valve
c. Sharpe
d. Or equal.

C. Resilient Wedge Gate Valves:

1. Comply with AWWA C515.
2. Materials:

a. Body, bonnet, nut, and handwheel: Ductile iron
b. Stem and stem nut: Bronze.

1) Wetted bronze parts in lead-free bronze.
2) Aluminum bronze components: Heat treated per AWWA C504

c. Wedge: Ductile iron covered in EDPM Rubber

d. Resilient seats: Styrene Butadiene Rubber (SBR).
e. Gaskets and Seals: EPDM or SBR rubber
f. Coating: 8-mils fusion bonded epoxy per AWWA C550; interior/exterior.
g. Nuts, bolts, and washers: Stainless steel.

3. Design Requirements:

a. Stem: NRS with O-ring stem seal
b. Ends: Flanged, mechanical joint, or bell-end connections as shown on drawings.
c. Working Pressure:

1) Sizes 12-inch diameter and smaller: 200-psig.
2) Sizes 16-inch diameter and larger: 150-psig.

d. Include the manufacturer's name, pressure rating, and year of fabrication cast into valve body.
e. Provide handwheels on all valves exposed or mounted in vaults. Size handwheels in accordance with AWWA C500.
f. Provide 2-inch actuator nut for buried valves. Furnish stem extensions when actuator nut is more than 4-feet below finished grade that extend to within 12-inches of finished grade.

4. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Mueller Company 2300 Series.
b. Clow Valve 2368 Series
c. American 2500 Series.
d. M & H 7500 Series
e. Or Approved Equal

2.2 DRY BARREL FIRE HYDRANTS

A. Description: UL Listed, FM Approved, [6]-inch AWWA C502 standard iron hydrant with a 5-1/2-inch valve flanged inlet, one NST [4-1/2”] and [two]NHST [2-1/2”]outlets, and base section with NPS [6”] mechanical-joint inlet suitable for [5]-feet of bury.

B. Design and Fabrication:

1. Working Pressure Rating: 200-psig minimum.
2. Case: Fabricate with multiple weep holes to readily drain water from standpipe.
3. Valve: Compression or gate design capable of throttling flow when partially opened and removable without digging up hydrant. Furnish with O-ring packing only.

4. Connection: Flange or mechanical joint (gland-type) with break-off spool.
5. Nozzles: Provide standard threads used by local Fire Department. Cast the direction of opening on hydrant dome.
6. Markings: Indicate Manufacturer, model and year.
7. Warranty: 10-year material and workmanship.

C. Materials:

1. Barrel, Flanges, Shoe: Ductile Iron
2. Nozzle Section: Cast Iron
3. Valve Plate, Sleeves, Stem, Nozzles, and Trim: Copper alloy
4. Washer, Pins Couplings: Stainless Steel
5. Cap Chains: Stainless Steel
6. Nuts and Bolts: Stainless Steel
7. O-rings, Seat, Gasket: Rubber
8. Coating: Epoxy primer and polyurethane coating in accordance with AWWA C550.

D. Acceptable Manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

   a. [See local water agency or Fire Dept for hydrant models]

2.3 WET BARREL FIRE HYDRANTS

A. Description: UL Listed, FM Approved, [6]-inch AWWA C503 standard iron hydrant [with beak away check valve], one NPS [4-1/2”] and [two]NPS [2-1/2”] outlets, and [6”]flanged inlet.

B. Design and Fabrication:

1. Working Pressure Rating: 200-psig minimum.
2. Valve: Fabricate with independently opening valves.
3. Connection: Flange or mechanical joint with break-off spool.
4. Threads: NFPA 1963, with external hose thread used by local fire department.
5. Markings: Indicate Manufacturer, model and year.
6. Operating and Cap Nuts: Pentagon, 1-1/8 inches point to flat.
7. Direction of Opening: Open hydrant valves by turning operating nut to left or counterclockwise.

C. Materials:

1. Body and Caps: Gray Iron
2. Stem, Nozzles, and Trim: Copper alloy

3. Cap Chains: Stainless Steel
4. Nuts and Bolts: ASTM A307, Grade B
5. O-rings: Rubber
6. Coating: Epoxy primer and polyurethane coating in accordance with AWWA C550.

D. Acceptable Manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Fire Hydrants:

1) Clow Valve Co, Model 960
2) James Jones Series 4060
3) Or approved equal.

b. Break-Away Check Valve:

1) Clow LBI-400A
2) Jones J-5000S
3) Or approved equal

2.4 WHARF HYDRANTS

A. Provide a UL listed bronze hydrants with a pentagon nut and brass cap and chain.

1. Inlet: size to match service lateral as shown on the Drawings
2. Outlet: 2-1/2” MHT conforming to NFPA No. 1963, unless otherwise noted on drawings.
3. Pressure: 300-psi
4. Adapter: Provide bronze adapters with caps where noted on Drawings.

B. Acceptable Manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Dixon WHYD Series
b. Croker 5200 Series
c. Potter-Roemer 4100 Series
d. Or Approved Equal

C. Acceptable Manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

    a. Dixon AV Series
    b. Croker 5000 Series
    c. Potter-Roemer 4060 Series
    d. Or Approved Equal

2.5 NON-FREEZE YARD HYDRANTS

A. Type: NSF-61 compliant, non-freeze yard hydrant with epoxy coated cast iron head with lockable lift handle, and bronze mechanism and valve housing.

B. Size: 3/4-inch hose thread outlet x 1-inch NPT inlet unless otherwise shown on Drawings.

C. Materials:

1. Casing: Stainless steel.
2. Head: Epoxy coated cast iron
3. Mechanism: Lead-free brass with replaceable seats.

D. Acceptable Manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

    a. Watts HY800.
    b. Woodford Y1
    c. JR Smith Fig 5900LF
    d. Josam 71400 Series
    e. Zurn Z195XL
    f. Or approved equal

2.6 NON-FREEZE POST HYDRANTS

A. Type: NSF-61 compliant, non-freeze, post-type hydrant with loose key.

B. Size: 3/4-inch hose thread outlet x 1-inch NPT inlet unless otherwise shown on Drawings.

C. Materials:

1. Casing: Galvanized steel.
2. Guard housing: Aluminum
3. Mechanism: Lead-free bronze with replaceable seats.

D. Acceptable Manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Wade W-8610.
b. Zurn Z1385
c. JR Smith Fig 5910 Series
d. Or approved equal

2.7 FILL STATIONS

A. Provide fill stations of one-piece, welded construction from 304 Sch 10 stainless steel with vandal-resistant spout.

1. Self-closing mushroom pushbutton OR paddle lever faucet that is operable with no more than 5-lbs of pressure.
2. Operating pressure from 30 to 80-psi
3. Pedestal mount with stainless steel hardware.

B. Acceptable Manufacturers:

1. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Most Dependable Fountain, [125 SM Series]
b. Stern-Williams [Series 7000]
c. Or approved equal

2.8 CORPORATION STOPS

A. Provide blow-out proof ball corp stops manufactured in accordance with AWWA C800 and that are certified NSF-61 and 372.

1. Design:

a. Ball-type, full-port, straight pattern.
b. Working Pressure: 300-psig
c. Connections:

1) Inlet: AWWA CC tapered thread
2) Outlet: [Restrained quick compression nut with pipe stiffener][FIPT].

2. Material:

a. Body, cap, and nut: Bronze conforming to ASTM B62
b. Ball: Fluorocarbon coated brass

c. Seats: Teflon, EDPM, or Buna-N
d. O-rings and Seal: Buna-N or EDPM rubber
e. Pipe Stiffener: 304 Stainless steel

3. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Ford FB100 Series
b. Mueller 300 B25000 Series
c. A.Y. McDonald 74101 Series
d. Jones E1900 Series
e. Cambridge Brass 301 Series
f. Or approved equal.

2.9 CURB STOPS

A. Provide curb stops manufactured in accordance with AWWA C800 and that are certified NSF-61 and 372.

1. Design:

a. Blow-out proof, ball-type, full-port, straight pattern with T-head.
b. Working Pressure: 300-psig
c. Connections: [Restrained quick compression nut with SST pipe stiffener unless otherwise shown.][FIPT]
d. Label curb valves on reclaimed water systems with “RW” or “Reclaimed Water”.

2. Material:

a. Body: Bronze conforming to ASTM B62
b. Ball: Fluorocarbon coated brass
c. Seats: Teflon, EDPM, or Buna-N
d. O-rings and Seal: Buna-N or EDPM rubber
e. Pipe Stiffener: 304 Stainless steel

3. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

a. Ford B44 Series
b. Mueller 300 B25200 Series
c. A.Y. McDonald 76104 Series
d. Jones E1900 Series
e. Cambridge Brass 202 Series
f. Or approved equal.

2.10 QUICK CONNECTION COUPLINGS

A. See Section 32 84 00 – Landscape Irrigation for irrigation quick couplings.

B. Provide quick couplers interchangeable with other brands.

1. Type: 2-piece body, 2 slot with locking lid
2. Size: 1-inch unless shown otherwise
3. Flow rate: 30-gpm at 40-psi
4. Warranty: 3-years
5. Lid Colors: Yellow or blue
6. Material:

    a. Body: Brass
    b. Trim and Springs: Stainless steel
    c. Lid: Thermoplastic or brass. Mark lid “Do Not Drink” where used on non-potable sources.

7. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

    a. Hunter
    b. Rain Bird
    c. Toro
    d. Or approved equal.

2.11 VALVE BOXES

A. Boxes shall be traffic-rated precast concrete with a cast iron lid marked “WATER”. Provide extensions so the box encases the valve bonnet. Center boxes over the operating nut. Raise boxes be raised to grade after paving is completed and place a concrete grade ring around the box to meet finished pavement grade.

B. Subject to compliance with the Contract Documents, the following manufacturers are acceptable:

1. Brooks 3RT
2. Christy G 5
3. Or Approved Equal

PART 3 – EXECUTION

A. Install products in accordance with the manufacturer’s instructions.

B. Install fire hydrants in accordance with AWWA M17.

1. Remove foreign material from barrel of hydrant before placement.

2. Install plumb and at same elevation as connecting pipe.
3. Block backside of hydrant, opposite pipe connection, with concrete firmly wedged between hydrant and vertical face of undisturbed trench.
4. Place granular bedding material around base of hydrant to the dimensions shown in the Drawings.
5. Firmly compact backfill around hydrant to surface of ground and to a 5-feet in front of hydrant.

C. Polyethylene Encasement of Valves and Fittings:

1. Wrap jagged, sharp, and irregular surfaces at fitting, valves, etc., with moldable filler tape.
2. Overlap polyethylene tube from pipe each side of valves or fittings a minimum of 2-feet and secure with tape.
3. Cut opening in tube at valve stem and secure around bonnet with 2 layers of tape.

END OF SECTION

SECTION 33 31 00

SANITARY SEWER PIPE

PART 1 – GENERAL

1.1 SUMMARY

A. This section includes sewer piping and related components outside the building including:

1. Sanitary Sewer Gravity Pipe and Fittings.
2. Sanitary Sewer Forcemain Pipe and Fittings

1.2 REFERENCES

A. Related Sections include but are not necessarily limited to:

1. Section 31 23 33 – Trenching and Backfilling

1.3 SCHEDULING

A. Provide State Representative 72-hours' notice to witness test. Conduct all tests under the observation of the State Representative.

1.4 SUBMITTALS

A. Action Submittals

1. Product Data: For all pipe, fitting, and valves.
2. Shop Drawings: layout drawings showing pipe sizes, locations, and elevations. Show other piping in same trench and clearances from sewer system piping. Indicate interface and spatial relationship between manholes, piping, and proximate structures.

3. Test and inspection reports.

PART 2 – PRODUCTS

2.1 PVC PIPE AND FITTINGS

A. PVC Gravity Sewer Piping:

1. Pipe: ASTM D3034, SDR 35, PVC Type PSM sewer pipe with push-on joints conforming to ASTM D3212.
2. Fittings: ASTM D3034, PVC with bell ends.
3. Gaskets: Synthetic rubber conforming to ASTM F477.
4. Joints: ASTM F656 solvent primer and D2564 solvent cement.

5. Color: Green

2.2 WARNING TAPE

A. Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility**,** with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches deep.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

B. Clear the pipe of all internal and external plastic burs. Apply pipe glue to both sides of joined pipe per manufacturer’s instructions.

C. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

D. Use fittings for branch connections unless direct tap into existing sewer is indicated.

E. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow and reducing pipe size with bushings are prohibited.

F. Use micro-tunneling when installing pipe under streets or other obstructions that cannot be disturbed.

G. Install piping according to the following:

1. Install gravity piping pitched down in direction of flow, at minimum slope of 2 percent unless otherwise indicated.
2. Install PVC Type PSM sewer piping according to ASTM D2321 and ASTM F1668.
3. Fully restrain pressure piping 4-inches and greater unless otherwise shown on the drawings. Use mechanical joints, manufacturer's proprietary restraint system, or cast-in-place-concrete thrust blocks and anchors.

H. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

3.2 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Install light-duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
2. Install heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.

B. Set cleanout frames and covers in cast-in-place-concrete as shown on the drawings. Set rim above surrounding grade in unpaved areas and flush with grade in paved areas as shown on the drawings.

3.3 CONNECTIONS

A. Connect non-pressure, gravity-flow sewer piping to building's sanitary building drains.

B. Make connections to existing piping and underground manholes.

1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye fitting plus 6-inch overlap with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3,000-psi.
3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes by cutting opening into existing unit large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe or manhole wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.

    a. Use concrete that will attain a minimum 28-day compressive strength of 3,000-psi unless otherwise indicated.

b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.

4. Protect existing piping and manholes to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.4 IDENTIFICATION

A. Place detectable warning tape over nonferrous piping as shown on the drawings.

3.5 CLEANING

A. Clean dirt and superfluous material from interior of piping. Flush with potable water.

3.6 FIELD QUALITY CONTROL – GRAVITY SEWER TESTING

A. Obstructions: After backfilling and compacting, but before paving or other surface improvements, test sewer for obstructions either by rodding or by the sewer ball method. Provide for intercepting all grit, rocks and other flushed debris to keep debris from entering the existing system.

B. At the option of the Contractor, either the following hydrostatic or air test shall be performed.

C. Hydrostatic Test:
1. Test after backfilling to finish grade or pavement structural section subgrade in paved areas.
2. Test sewer mains between successive manholes by closing the lower end of the sewer main to be tested and the inlet sewer main of the upper manhole with stoppers.
3. Fill pipe and manholes with water to a point four feet below the ground surface of the upper manhole, but in no case less than four feet above the pipe invert. If ground water is present, the water surface at the upper manhole shall be at least four feet above the level of the ground water.
4. Fill piping at least one hour prior to testing.
5. Test piping at least two hours by maintaining the head specified above with measured additions of water. The sum of these additions of water, in the two-hour test period, shall be the leakage amount.
6. The maximum allowable head of water above any porti9n of sewer being tested shall be 15-feet. Where the difference in elevation between successive manholes exceeds 15-feet, a test tee shall be installed between manholes, and the testing shall be carried on between the tee and the manhole.
7. The allowable leakage shall not exceed 0.1-gallons per minute per inch diameter, per 1000-feet of sewer main being tested.
8. If the leakage exceeds the above amount, determine the cause and remedy it prior to retesting.

9. If the leakage is less than the allowable, but leaks are observed, repair the observed leaks.

D. Air Test:
1. Test after backfilling to finish grade or pavement structural section subgrade in paved areas.
2. Apply to each length between adjacent manholes.
3. Supply pressure gauge with minimum divisions of 0.10-psi and with an accuracy of +/- 0.04-psi. When requested by the Owner, provide certification that the gauge has been tested for accuracy within the last six months by a reliable testing firm.
4. Pressurize the test section to 3.5-psi, and then hold the pressure above 3.0-psi during a saturation period of at least 5 minutes. At the end of the saturation period, note the pressure, which must be a minimum of 3.0-psi, and begin the timed period. If the pressure drops 0.5-psi in less than the time given in the following table the section of pipe has not passed the test.
5.

Pipe Size	Minimum Time Allowed for Pressure to Drop 0.5-PSI
4″	125 seconds
6″	185 seconds
8″	245 seconds
10″	310 seconds
12″	370 seconds
15″	460 seconds
18″	555 seconds
21″	10 minutes
24″	12 minutes
27″	14 minutes
30″	16 minutes
36″	18 minutes
42″	20 minutes
48″	23 minutes
54″	26 minutes

6. If the time for the pressure to drop 0.5-psi is 125% or less of the time indicated, the line shall immediately be re-pressurized to 3.0-psi and the test repeated. If, during the 5-minute saturation period, the pressure drops less than 0.5-psi after the initial pressurization and air is not added, the section undergoing the test shall have passed.
7. If the test did not pass, find and repair the leak to the satisfaction of the Owner.
8. When the prevailing ground water is above the line being tested the air pressure shall be increased 0.43-psi for each foot the water table is above the invert of the pipe at the highest manhole.

END OF SECTION

SECTION 337116.33

WOOD ELECTRICAL UTILITY POLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Wood electrical utility poles
2. Guying and anchoring provisions where indicated
3. Accessories required for a complete wood electrical utility pole installation.
4. Setting, alignment, backfilling, and compaction of wood utility poles.

1.2 REFERENCES

A. Comply with the latest adopted editions of applicable standards and codes unless otherwise indicated.

B. American National Standards Institute (ANSI):

1. ANSI O5.1 – Specifications and Dimensions for Wood Poles

C. American Wood Protection Association (AWPA)

1. AWPA U1 – Use Category System: Use specification for treated wood.
2. AWPA M – Standard for the care of preservative-treated wood products.

D. National Electrical Safety Code (NESC), ANSI C2.

E. California Electrical Code (CEC), where applicable

F. Applicable serving utility standards and construction requirements.

1.3 DEFINITIONS

A. Pole Class: Designation indicating the required structural capacity and dimensions of the pole in accordance with ANSI O5.1.

B. Groundline: The elevation at which the finished grade intersects the installed pole.

C. Preservative-Treated Wood: Wood treated with an approved preservative system suitable for the intended exposure and ground-contact application.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Manufacturer's data for wood poles.
2. Pole species and treatment certificate.
3. Pole class and length.
    a. Dimensional information to include diameter indicated as required by the structural drawings.
4. Hardware and accessory information.

B. Installation Procedures:
1. Submit the proposed hole diameter, tamping equipment/procedure, and compaction-verification method. Address how compaction will be achieved and verified in the deep, narrow space around the pole.

1.5 QUALITY ASSURANCE

A. Manufacturer: Provide poles from manufacturers regularly engaged in manufacturing wood utility poles of the type specified.

B. Do not mix pole species, treatment systems, or grading systems without approval.

C. Verify pole dimensions, class, length, and treatment before installation.

D. Pole selection shall account for the intended loading, including:

1. Conductors
2. Wind Loading
3. Guying forces, where applicable
4. Other utility attachments

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver poles with identification tags intact.

B. Handle poles in a manner that prevents damage to the preservative treatment and structural members.

C. Do not drag poles over abrasive surfaces.

D. Do not allow poles to remain in standing water.

E. Store poles off the ground on suitable supports.

F. Protect poles from contamination by oil, chemicals, concrete, or other materials that could adversely affect the preservative treatment.

G. Reject poles exhibiting excessive splitting, decay, insect damage, crushing, excessive holes, or other structural defects.

PART 2 - PRODUCTS

2.1 WOOD UTILITY POLES

A. Wood utility poles shall comply with ANSI O5.1.

B. Species:

1. Douglas Fir
   a. Pressure-treated.
2. Other species shall not be used without written approval.

C. Pole length and class:

1. As indicated on Drawings.
   a. Poles indicated on the structural drawings shall have the minimum diameter indicated at grade.
2. Minimum pole class shall be as indicated.
   a. Class 1 for cantilevered poles indicated on the structural drawings.
3. Where pole class is not indicated, provide pole class based on the governing utility loading requirements and obtain Engineer approval.

D. Poles shall be:

1. Straight and sound.
2. Uniformly tapered.
3. Free from decay.
4. Free from significant insect damage.
5. Free from unacceptable checks, splits, shakes, and compression failures.
6. Structurally suitable for the specified application.

E. Poles shall be machine-peeled or manufactured in accordance with ANSI O5.1.

F. Connectors, Splices, and Conductor Securing and Protecting Components: Items include wire clamps, ties, conductor armor, fittings, connectors, and terminals. Listed for the specific applications and conductor types and combinations of materials used. Descriptions as follows for various applications:

1. Copper to Copper: Copper alloy, complying with UL 486A-486B.
2. Aluminum Composition to Aluminum Composition: Aluminum alloy, complying with UL 486A-486B.
3. Copper to Aluminum Composition: Type suitable for this purpose, complying with UL 486A-486B.
4. Connectors and Splices for Secondary Conductors: Listed and labeled for the conditions and materials involved in each application.

5. Taps for Medium-Voltage Line Conductors: Hot-line clamps, screw type, with concealed threads and bare, hard-drawn copper stirrups. Listed for the combination of materials being connected.
6. Splices under Tension: Compression type with strength exceeding the conductors spliced.

2.2 PRESERVATIVE TREATMENT

A. Treat wood poles for ground-contact exposure using an AWPA-approved preservative treatment appropriate for utility poles.

B. Treatment shall comply with AWPA U1 and applicable AWPA requirements.

C. Preservative treatment shall provide adequate penetration and retention for the pole species and intended service condition.

D. Do not use poles with untreated groundline sections unless specifically permitted by the treatment standard and approved by the Engineer.

E. Field cuts, holes, and damage to treated surfaces shall be field-treated using an approved preservative compatible with the original treatment system.

2.3 POLE HARDWARE

A. Provide galvanized steel or other corrosion-resistant hardware suitable for exterior utility service.

B. Bolts, nuts, washers, braces, plates, brackets, and related hardware shall be sized for the applicable structural loads.

C. Hardware shall be compatible with treated wood and shall not adversely affect the preservative treatment.

D. Provide pole bands, brackets, equipment supports, and other accessories as indicated.

2.4 GUYS AND ANCHORDS

A. Provide guy wires, guy guards, guy clamps, thimbles, anchor rods, and anchors where indicated.

B. Guy wire shall be galvanized steel strand suitable for utility service.

C. Anchor assemblies shall be designed for the required guy loads and soil conditions.

D. Provide guy guards where required for safety and visibility.

E. Install anchors in accordance with the approved pole-framing and guying design.

2.5 GROUNDING

A. Provide grounding electrodes, grounding conductors, bonding jumpers, clamps, and associated hardware as indicated.

B. Grounding components shall comply with the applicable requirements of NFPA 7, CEC, NESC, and serving utility requirements.

C. Grounding hardware shall be listed for the intended application.

D. Bond metallic pole-mounted equipment to the grounding system as required.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify pole locations, elevations, underground utilities, access, and site conditions before installation.

B. Verify that pole lengths and classes, and minimum diameters correspond to the approved drawings, including requirements shown on the structural drawings.

C. Do not install poles until unsatisfactory conditions have been corrected.

3.2 POLE HOLES

A. Located pole holes as indicated on Drawings.

B. Determine hole depth based on the approved structural design, pole length, soil conditions, and applicable utility requirements.
   1. See structural drawings for embedment depth (not a standard utility depth) and maximum exposed height.
   2. Minimum hole diameter shall be 10”-12” greater than the diameter of the pole butt.
   3. Include drainage-rock bedding as indicated on the drawings.

C. Coordinate excavation with existing underground utilities.

D. Keep excavated material from interfering with installation.

E. Maintain stable hole walls and remove loose material from the bottom. Notify the State Representative and the structural/geotechnical engineers if groundwater, caving, soft soils, or uncontrolled fill is encountered.

3.3 POLE INSTALLATION

A. Set poles plumb unless otherwise indicated.

B. Install poles to the specified setting depth.

C. Orient poles and pole hardware as shown on Drawings.

D. Maintain required conductor clearances and equipment elevations.

E. Protect poles from damage during handling and setting.

F. Approval is required for any field modifications.

G. Do not use excessive force that could crush, split, or otherwise damage the pole.

H. After setting, backfill the pole hole using suitable native or imported compactable soil accepted by the geotechnical engineer. Limit drainage rock to the bedding shown unless another backfill material is specifically approved.

I. Compact backfill in 6-inch maximum loose lifts and at least 90% of ASTM D1557 maximum dry density. Compact using mechanical tamping around the full circumference and throughout the embedment depth; jetting or flooding is prohibited.

J. Finish the surface to drain away from the pole and restore adjacent improvements.

K. Remove excess excavated material from the site.

3.4 GUYING AND ANCHORING

A. Install guy wires and anchors at locations shown on Drawings or as indicated.

B. Install guy wires with proper tension and alignment.

C. Do not place guy anchors where they interfere with access, pedestrian circulation, drainage, or other facilities.

D. Verify anchor capacity where soil conditions differ materially from those assumed in the design.

E. Install guys to resist unbalanced loads, including those developed at angles, corners, and dead ends. Install two or more guys if a single guy will not provide adequate strength. Install separate guys if unbalanced loads are separated by 36 inches or more. Comply with IEEE C2.

1. Unless a thimble eye is used, at the pole end, install a minimum of two guy hooks and two guy strain plates.

2. At the anchor end, attach guy strand assembly with preformed grips.

F. Protect guy strands from damage. Replace damaged guy strands. Install guy insulators where required to comply with IEEE C2 clearance requirements.

G. Install guys with a lead-to-height ratio of 1 to 1 unless otherwise indicated. The minimum lead-to-height ratio shall be 1/2 to 1. When less than 1 to 1, increase guy strength by the ratio of the sine of the lead angle indicated to the sine of the lead angle provided.

H. Install screw-type guy anchors aligned in soil with guy. Set with anchor rod pointing at guy attachment on pole and rod projecting 6 to 9 inches from ground.

I. Install strain insulators to provide a minimum of 12 inches of clearance between the nearest energized surface and the strain insulator fitting farthest from the pole. When loaded to the tension indicated, fiberglass strain insulators shall be loaded to not more than two-thirds of manufacturer's published rating.

J. Guy Markers: Install at anchor end of guys to visually mark the guy wire at all accessible locations. Clamp to guy strand or anchor at top and bottom of marker.

3.5 GROUNDING

A. Install grounding conductors and electrodes as indicated.

B. Make grounding connections tight and electrically continuous.

C. Protect grounding conductors from mechanical damage.

D. Bond metallic equipment and hardware as required.

E. Test ground system after installation where testing is specified.

3.6 FIELD TREATMENT

A. Treat field cuts, drilled holes, abrasions, and other damaged treated surfaces with an approved preservative treatment.

B. Apply field treatment in accordance with the preservative manufacturer’s written instructions.

C. Do no install poles with untreated or damaged groundline areas unless repaired and approved.

3.7 HARDWARE AND ACCESSORIES INSTALLATION

A. Install washers against wood and under nuts, including eye nuts and locknuts.

B. Install nuts and locknuts wrench-tight on threaded connections.

3.8 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Geotechnical Engineer shall provide observation of soil conditions, embedment, and backfill placement, with documented compaction acceptance before applying conductor loads. Coordinate these requirements with the special inspections as indicated on the drawings.

2. Furnish instruments and equipment required for tests that comply with NETA Acceptance Testing Specification.
3. Guy Anchors: Test one of each type and capacity installed. Apply rated pull-out force in the same pull direction applied by the guy at the test location.

    a. Acceptable Test Results: Denoted by movement of less than 3/8 inch by the holding component of the anchor in the earth or other medium in which it is installed.
    b. Replace or reinstall, at State's option, all anchors of same type and capacity as anchor type that fails this test.

4. Ground Resistance: Comply with Section 260526 "Grounding and Bonding for Electrical Systems." Measure resistance of each separate grounding electrode, including pole grounds. Also measure resistance of separate grounding electrode systems before bonding together.

    a. Perform tests and obtain acceptable results before energizing any portion of overhead electrical distribution system.
    b. Results and Follow-up: If ground resistance for a single ground electrode or pole ground, tested individually, exceeds 25 ohms, add a ground electrode not less than 10 feet away and interconnect with No. 2 AWG, minimum, bare conductor buried at least 12 inches below furnished grade.

5. Aerial Conductor Sag and Tension: Observe procedures used by Contractor to verify that initial stringing sags and tensions comply with IEEE C2 and conductor manufacturer's product data and written recommendations.
6. Neutral-Supported, Secondary Service-Drop Cable: Test for insulation resistance while cable is isolated, before connecting or energizing. Minimum acceptable resistance is 100 megohms.

B. Prepare test and inspection reports.

C. Replace poles that are damaged during installation or that do not comply with the contract documents.

3.9 OBSERVATION AND ACCEPTANCE

A. Upon completion, verify that:
   1. All poles are securely installed.
   2. Poles are properly aligned.
   3. Guying and anchoring are complete.
   4. Grounding is complete.
   5. Pole-mounted equipment is properly supported.
   6. Required clearances are maintained.
   7. Damage treated surfaces have been repaired.

B. Remove construction debris and excess materials from the work area.

3.10 PROTECTION

A. Protect installed poles and associated equipment from damage until Final Acceptance.

B. Repair damage to preservative-treated surfaces.

C. Replace poles that have been structurally damaged and cannot be satisfactorily repaired.

END OF SECTION 337116.33