



PROJECT MANUAL

For

PRAIRIE CITY SVRA
Quarter Midget Track Area
Accessibility Improvements
Phase II
Sacramento County, California

August 2009



**STATE OF CALIFORNIA
THE RESOURCES AGENCY
DEPARTMENT OF PARKS AND RECREATION**

**CALIFORNIA DEPARTMENT
OF
PARKS AND RECREATION
PRAIRIE CITY STATE VECHICLE
RECREATION AREA
QUARTER MIDGET TRACK AREA
ADA ACCESSIBILITY IMPROVEMENT
PHASE II
RANCHO CORDOVA, CA
SACRAMENTO COUNTY, CALIFORNIA**

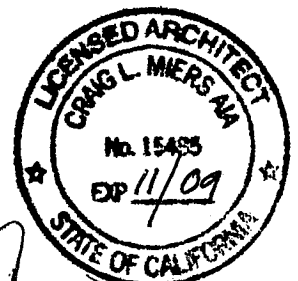


CALIFORNIA STATE FIRE MARSHAL
APPROVED

Approval of this plan does not authorize or approve
any omission or deviation from applicable regula-
tions. Final approval is subject to field inspection.
One set of approved plans shall be available on the
project site at all times.

Reviewed by: Pam El
6-15-09

March 2009



Craig L. Miers

DEPARTMENT OF PARKS AND RECREATION

SMALL BUSINESS NOTICE

Your business may now qualify for "Small Business" Certification with the State of California! On January 1, 1999, the legal definition of "small business" changed, making it possible for more small businesses to qualify for this valuable certification.

Your firm may now be eligible if it meets all of the following:

- Annual receipts averaging \$10 million or less over the previous three years?
(Note: manufacturers do not have to meet this criteria)
- One hundred or fewer employees?
- Is your firm's principal office located in California, and its owners and officers living in California?
- Is it independently owned and operated?

The State of California Department of General Services, Procurement Division, Office of Small Business and DVBE Services (OSDS) offers many services that assist both contracting state agencies and contractors/business owners with a variety of information designed to streamline the state contracting process. For example, certified Small Businesses (SB) and Disabled Veteran Business Enterprises (DVBEs) are now listed at no charge on OSDS' website so state contracting officials can easily contact them to verify certification status and to develop referral lists for use by contractors bidding on state contracts. ***Please note most DVBEs also qualify for "Small Business" certification.***

On the OSDS website, the California State Contracts Register (CSCR) electronically announces contracting opportunities daily. One of many new services available to all businesses, the Subscription Outreach Service (SOS), sends firms notices (fax or e-mail) of California government contracting opportunities that match the services and products they provide. Contractors are able to complete a "profile" of their business, and OSDS forwards contracting opportunities that fit the contractor's specific profile. Please check out this and many other services in greater detail on OSDS' website: <http://www.pd.dgs.ca.gov/smbus>.

The Department of Parks and Recreation (DPR) welcomes all its contractors and suppliers as business partners and thanks them for supporting its mission to provide for the health, inspiration, and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valued natural and cultural resources, and creating opportunities for high-quality outdoor recreation. DPR's mission is further enhanced by the goods and services you provide.

What is the Small Business Preference?

A five (5%) percent preference will be granted to the bidder properly approved as "Small Business" in accordance with Title 2, California Code of Regulations, Section 1896, et seq. A small business firm must have an approved certification form (STD 813) on file with the Department of General Services, Small Business and DVBE Services, 707 Third Street, First Floor - Room 400, West Sacramento, CA 95605, by 5:00 p.m. on the bid opening date.

To assist the Department in a timely evaluation of bids received, any bidder requesting the small business preference is encouraged to submit with the bid a copy of his/her small business certification approval letter from OSDS.

How does the 5% Small Business Preference Work?

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 Preference	Small Business Status
1	\$30,750	\$30,750	Claims small business status, but <i>is not</i> OSBDS-certified.
2	\$28,975	\$28,975	Does not claim to be small business.
3	\$29,520	\$29,520	Claims small business status, but <i>is not</i> OSBDS-certified.
4	\$29,870	\$28,421	Claims small business status and <i>is</i> OSBDS-certified.

Computation Method

Five percent is applied to the lowest (non-certified small business) responsible bid
([Bidder 2] \$28,975 x .05 = \$1448.75).

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).

Bidder 4's computed total is \$28,421.25, making them the lowest bidder.

The contract is awarded to Bidder 4 for \$29,870.

Notes: The five percent bid preference **does not apply** when the certified small business is the lowest bidder. Also, the 5% preference is used only for computation purposes to determine the successful bidder and **does not alter the amounts of the actual bids**.

Contact OSDS to find out more:

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.pd.dgs.ca.gov/smbus
Receptionist: (916) 375-4940
24-hour recording (916) 322-5060
FAX: (916) 375-4950

**NOTICE OF
Disabled Veteran Business Enterprise (DVBE)
INCENTIVE PROGRAM
for Invitation For Bids (IFB)**

Your bid may qualify for the DVBE Incentive Program.

What is the DVBE Incentive Program?

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

Who is eligible to receive the incentive?

Any responsive and responsible bidder with an eligible amount of DVBE participation per Table A below.

Who is not eligible for the incentive?

Bidders who do not gain enough DVBE participation per Table A below and bidders who are not responsive and responsible regardless of the amount of DVBE participation.

How does the DVBE Incentive Program Work?

Table A – IFB (aka Low Price Method)

Confirmed DVBE Participation of	DVBE Incentive Amount for IFB
6% or more	5% of lowest responsive and responsible bid
Good Faith Effort (GFE) is required if less than 6 % DVBE participation is achieved	
5% - 5.99%	4% of lowest responsive and responsible bid
4% - 4.99%	3% of lowest responsive and responsible bid
3% - 3.99%	2% of lowest responsive and responsible bid
Less than 3%	N/A

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

Computation Method

The DVBE incentive is used only for evaluation purposes to arrive at 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.

For contracts 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 above. Example 1 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.

Example 1 –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	2%	8%	4.5%
5 steps of GFE	No	n/a	Yes
Initial Ranking	Unresponsive	2	1
DVBE Incentive (from Table A)	n/a	5%	3%
Incentive Amount (% times lowest responsive and responsible bid price)	n/a	\$5,000.00 (5% x \$100,000)	\$3,000.00 (3% x \$100,000)
Adjusted Bid Price (bidder's price minus bidder's incentive amount)	n/a	\$97,100.00 (\$102,100-\$5,000)	\$97,000.00 (\$100,000-\$3,000)
Final Rank	Unresponsive	2	1

OFFICE OF SMALL BUSINESS AND DVBE SERVICES

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 DVBE contractors. For more information, please:

Contact OSDS to find out more:

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.pd.dgs.ca.gov/smbus
Receptionist: (916) 375-4940
24-hour recording (916) 322-5060
FAX: (916) 375-4950

THE RESOURCES AGENCY OF CALIFORNIA
DEPARTMENT OF PARKS AND RECREATION
PRAIRIE CITY STATE VEHICLE RECREATION AREA
QUARTER MIDGET TRACK AREA
ACCESSIBILITY IMPROVEMENTS
PHASE II
Sacramento County, California

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

**PUBLIC WORKS
NOTICE TO CONTRACTORS**

**PRAIRIE CITY SVRA
QUARTER MIDGET TRACK AREA
ACCESSIBILITY IMPROVEMENTS
PHASE II
Sacramento County, California
Bid Number: C09E0005**

Sealed bids will be received at the office of the Department of Parks and Recreation, One Capitol Mall, Suite 410, Sacramento, California 95814, **up to 2 p.m., Tuesday, August 18, 2009**, at which time and place they will be publicly opened and read for performing the work as follows:

Furnish all labor, materials, tools and equipment necessary to remove an existing restroom building and replace with a new ADA compliant prefabricated Comfort Station. The work includes ADA Parking; utility improvements; a new leach field; ADA Path of travel improvements and ADA improvements to the bleachers; and, other ADA work at various locations at the Quarter Midget Track Area at **PRAIRIE CITY SVRA** in Sacramento 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 or B

Engineer's Estimate: \$342,359

NOTE: There is no job showing.

The bidder agrees to complete all work within **ONE HUNDRED TWENTY (120)** 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.

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 <http://www.eprocure.dgs.ca.gov/CSCRAbs.htm>. At the website in the middle of the page for the first SEARCH pane, enter the following Bid Number: C09E0005 to view the full advertisement/bid documents. 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 email to Plans Counter at planscounter@parks.ca.gov or FAX to (916) 445-9027 no later than 5 p.m., seven (7) calendar days prior to bid opening date.

It is the responsibility of the bidders to download any addendum 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.

Bond requirements for contracts exceeding \$5,000 are stated in the General Conditions, DPR 483, Section 00700.

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. 813) on file at the 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.eprocure.dgs.ca.gov/default.htm>). If bidder wants "Small Business" preference on this project, bidder must sign STD. 811 form (Small Business Preference and Certification Request) and submit with bid.

Non-Small Business Preference

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, the proposal must include a list of the small business(es) with which you commit to subcontract in an amount of at least twenty-five percent (25%) of the net bid price with one or more California certified small businesses. Each listed certified small business must perform a "commercially useful function" in the performance of the contract as defined in Government Code Section 14837(d)(4). **Indicate in your Proposal whether or not you are claiming the non-small business preference.** The required list of California certified small

business subcontracts must be attached to the proposal and must include the following: 1) subcontractor name, 2) address, 3) phone number, 4) a description of the work to be performed and/or products supplied, 5) and the dollar amount or percentage of the net bid price (as specified in the solicitation) per subcontractor.

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 Enterprise Program: All DPR contracts over \$10,000 shall have a participation goal of **not less than 6%** for Disabled Veteran Business Enterprises. **ALL REFERENCES ON THE STD 840, DOCUMENTATION OF DVBE PROGRAM REQUIREMENTS, THAT REFER TO 3% PARTICIPATION ARE HEREBY AMENDED TO READ 6%.** In addition to other contracting requirements, to qualify as a responsive bidder, the bidder must either certify that the required goal has been achieved, or demonstrate that a good faith effort was made to meet the goal. Note: If a Good Faith Effort is documented in lieu of the 6% DVBE participation goal, Ads must be published at least 14 days prior to the bid due date (refer to Page 3 of the DVBE requirements).

DVBE Incentive: For evaluation purposes only, an incentive will be given to bidders who meet the DVBE requirements, either through achieving the 6% DVBE participation or achieving less than the minimum 6% DVBE participation and completing a Good Faith Effort.

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 Conditions at www.ols.dgs.ca.gov/Standard+Language.)

DEPARTMENT OF PARKS AND RECREATION
Ruth G. Coleman, 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 Department of Parks and Recreation office listed in the Notice to Contractors.

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 in an envelope using the pre-addressed label provided with the bidders checklist. This envelope shall be sealed and delivered to the place shown prior to the time and date for the bid opening. This envelope must have the return address of the bidder. It is the responsibility of the bidder to see that his/her bid is received in proper time. Facsimile (FAX) responses will not be considered.
- 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 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. BIDDER'S SIGNATURE ON THE FORM MUST BE NOTARIZED.
- 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.
- Q. Bids exceeding \$10,000 shall meet the Disabled Veteran Business Enterprise (DVBE) participation goal or bidders shall make a good faith effort to meet this goal as prescribed herein.

1.04 CONTRACT

- A. **Bids shall remain valid for 120 calendar days after the bid opening date:** The State will endeavor to execute a contract within 120 calendar days from the bid opening date. The contract is not executed until the appropriate State agency has approved the contract. Bidders shall hold their bids for 120 calendar days after the bid opening date. Upon expiration of 120 calendar days from the bid opening date, bidders may withdraw their bids. If bidder, after expiration of 120 calendar days from the bid opening fails to withdraw its bid and a contract is subsequently approved by the appropriate State agency and executed, bidder shall have no claim for any reason to amend its bid.
- 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 Bidder" 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 required contract documents.

- D. The apparent low bidder shall execute the required number of copies of the contract documents and return them within seven (7) 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 seven (7) days, not including Saturdays, Sundays and Legal Holidays may be deemed refusal of an award which shall 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) for bids that exceed \$147,000. 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.

Exhibit B, Attachment 1
PUBLIC WORKS BID FORM

BID TIME	BID DATE
2 PM	August 18, 2009
PROJECT LOCATION	
PRAIRIE CITY SVRA	
PROJECT NAME	
Quarter Midget Track Area Accessibility Improvements Phase II	

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 without the appropriate bidder signature will result in rejection of the bid.

BY (Authorized Signature)	DATE
PRINTED NAME AND TITLE OF PERSON SIGNING	

CONTRACTOR/BIDDER FIRM NAME (Printed)	PHONE NO.	FAX NO.
ADDRESS	EMAIL ADDRESS:	
CITY/STATE/ZIP CODE		
LICENSE CLASSIFICATION	LICENSE NO.	LICENSE EXPIRATION DATE
STATUS OF BUSINESS (Check appropriate box.)		
☐ 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 perform work or labor or render services in an amount in excess of one-half of one percent of the general contractor's total bi 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.

The bidder hereby proposes to furnish all labor, materials, tools and equipment necessary to remove an existing restroom building and replace with a new ADA compliant prefabricated Comfort Station. The work includes ADA Parking; utility improvements; a new leach field; ADA Path of travel improvements and ADA improvements to the bleachers; and, other ADA work at various locations at the Quarter Midget Track Area at **PRAIRIE CITY SVRA** in Sacramento 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:

ADDENDUM ACKNOWLEDGEMENT (Please initial for Addendums received)

Addendum #1 _____ Addendum #3 _____
 Addendum #2 _____ Addendum #4 _____

The bidder agrees to complete all work within **ONE HUNDRED TWENTY (120)** 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.

Participation in Disabled Veteran Enterprise Program: All DPR contracts over \$10,000 shall have a participation goal of **not less than 6%** for Disabled Veteran Business Enterprises. **ALL REFERENCES ON THE STD 840, DOCUMENTATION OF DVBE PROGRAM REQUIREMENTS, THAT REFER TO 3% PARTICIPATION ARE HEREBY AMENDED TO READ 6%.** In addition to other contracting requirements, to qualify as a responsive bidder, the bidder must either certify that the required goal has been achieved, or demonstrate that a good faith effort was made to meet the goal. Note: Ads must be published at least 14 days prior to the bid due date (refer to Page 3 of the DVBE requirements).

DVBE Incentive: For evaluation purposes only, an incentive will be given to bidders who meet the DVBE requirements, either through achieving the 6% DVBE participation or achieving less than the minimum 6% DVBE participation and completing a Good Faith Effort.

SMALL BUSINESS PREFERENCE: *To assist the Department in a timely evaluation of bids received, any bidder requesting the small business preference on this project is encouraged to submit along with signed STD. 811 - Small Business Preference and Certification Request, a copy of his/her small business certification approval letter from the State Office of Small Business and Disabled Veteran Business Enterprise Certification.*



IMPORTANT NOTICE

DVBE FORM STD 840

ALL REFERENCES ON THE STD 840, *DOCUMENTATION OF DVBE PROGRAM REQUIREMENTS*, THAT REFER TO 3% PARTICIPATION ARE HEREBY AMENDED TO READ 6%.

BIDDERS MUST FULLY DOCUMENT AT LEAST ONE OF THE FOLLOWING OPTIONS TO COMPLY WITH DVBE REQUIREMENTS:

OPTION A – COMMITMENT TO FULL 6% DVBE GOAL

Bidder is a DVBE or uses identified DVBE(s) to meet full 6% participation goal.

OPTION B – GOOD FAITH EFFORT

Bidder must fully document all 4 contacts made with DVBE resources as well as publish advertisements. DVBE ads must be published at least 14 days prior to the bid due date.

OPTION C – BUSINESS UTILIZATION PLAN

Applies only to goods, information technology and services.

**IF YOU HAVE ANY QUESTIONS OR NEED HELP FILLING OUT THE
FORMS, CONTACT JAN VANDERBECK AT (916) 654-9788**

California Disabled Veteran Business Enterprise Program Requirements

(REV. 9-15-03)

AUTHORITY. The Disabled Veteran Business Enterprise (DVBE) Participation Goal Program for state contracts is established in Public Contract Code (PCC), Section 10115 et seq., Military and Veterans Code, Section 999 et seq. and California Code of Regulations, Title 2 (2CCR), Section 1896.60 et seq.

The minimum DVBE participation percentage is 3% for this solicitation unless another percentage is specified in the solicitation.

INTRODUCTION. The bidder must document at least one of the options (A, B or C) in this document to comply with this solicitation's DVBE program requirements. Bids or proposals (hereafter called "bids") that fail to fully document one of the DVBE program requirements options shall be considered non-responsive and ineligible for award.

All information submitted by the intended awardee to comply with this solicitation's DVBE requirements will be verified by the State. If evidence of an alleged violation is found during the verification process, the State shall initiate an investigation with this information in accordance with the requirements of the Public Contract Code, Section 10115, et seq. and the Military and Veterans Code, Section 999 et seq. and follow the investigatory procedures required by the California Code of Regulations, Section 1896.80.

Only State of California, Office of Small Business and DVBE Certification certified DVBEs who perform a commercially useful function relevant to this solicitation may be used to satisfy the DVBE program requirements. The criteria for performing a commercially useful function are contained on page 5, Resources & Information and California Code of Regulations, Title 2, Section 1896.61(l). Verify each DVBE subcontractor's/supplier's certification with the Office of Small Business and DVBE Certification Section to ensure DVBE eligibility.

To meet the DVBE program requirements, bidders must complete and fully document at least one of the following compliance options:
Option A - Commitment to full DVBE participation - For a bidder who is a DVBE or who is able to meet the commitment to use identified DVBE(s) to fulfill the full DVBE participation goal.
Option B - Good Faith Effort - For a bidder documenting its completed effort, made prior to the bid due date, to obtain DVBE participation that may result in partial or no DVBE participation.
Option C - Business Utilization Plan - For a bidder using an annual plan (subject to approval) to satisfy DVBE participation requirements. Applies only to solicitations for goods and information technology.

PLEASE READ ALL INSTRUCTIONS CAREFULLY. These instructions contain information about the DVBE program requirements, bidder responsibilities, and requirements for performing and documenting each of the three available options as detailed below. Bidders are responsible for thorough review and compliance with these instructions. Document your option selection on the attached STD Form 840, Documentation of Disabled Veteran Business Enterprise Program Requirements.

OPTION A – COMMITMENT -- Commit to meet or exceed the DVBE participation requirement in this solicitation by either Method A1 or A2. Bidders must document DVBE participation commitment by completing and submitting the attached STD 840. Failure to complete and submit STD 840 (Side 1) as instructed shall render your bid non-responsive.

The bidder must provide, prior to contract award, a written agreement signed by the bidder and each proposed DVBE subcontractor. The written agreement will include the DVBE scope of work, work to be performed by the DVBE, term of intended subcontract with the DVBE, anticipated dates the DVBE will perform required work, rate and conditions of payment, total amount of contract to be paid to the DVBE, and the percentage of the entire contract that will be awarded to the DVBE, with each DVBE subcontractor. If this information is contained in the bidder's DVBE written agreement of intent, the agreement may be attached to the STD 840. If further verification is necessary, the state will obtain additional information to verify the above requirements.

Method A1. Certified DVBE bidder:

- a. Commit to performing at least 3% of the contract bid amount (unless otherwise specified) with your firm or in combination with other DVBE(s).
- b. Document DVBE participation on STD 840 (Side 1) and attach a copy of all applicable certifications.
- c. A DVBE bidder working in combination with other DVBEs shall be requested to submit proof of its commitment by submitting a written agreement with the DVBE(s) identified in its bid's STD 840. When requested, the written agreement must be submitted to the address or facsimile number specified and within the timeframe identified in the notification. Failure to submit the requested written agreement as specified may be grounds for bid rejection.

Method A2. Non-DVBE bidder:

- a. Commit to using certified DVBE(s) for at least 3% (unless otherwise specified) of the bid amount.
- b. When a bidder commits to less than the required 3% DVBE participation or its commitment may fall below 3% if specific line items/groups are not selected for award, then Option B, Good Faith Effort must be completed in addition to Option A, Commitment.
- c. Document DVBE participation on STD 840 (Side 1) and attach a copy of the DVBE's certification.
- d. Prior to contract award, a bidder is to submit proof of their commitment by submitting a written agreement with the DVBE(s) identified in its bid's STD 840. The awarding department contracting official named in this solicitation will contact each listed DVBE, by mail, fax or telephone, for verification of the bidder's submitted DVBE information. The written agreement must be submitted to the address or facsimile number specified and within the timeframe identified in the notification. Failure to submit the written agreement as specified may be grounds for bid rejection.

OPTION B – GOOD FAITH EFFORT (GFE) performance and documentation requirements must be completely satisfied prior to bid submission if you are unable to obtain and commit to the full DVBE participation percentage goal (Option A) and do not exercise Option C. Perform and document the following Steps 1 through 5 on both sides of the attached STD 840 form. Failure to perform and document GFE Steps 1 through 5 as instructed, which includes properly completing and submitting both sides of STD 840, shall result in your bid being deemed non-responsive. Step 3, Advertisement, is required unless specifically waived for this solicitation due to time limits imposed by the awarding department.

Step 1 Awarding Department - Contact the department's contracting official named in this solicitation to identify interested DVBEs. You must fully document this contact and describe the results on STD 840 (Side 2).

Step 2 Other State and Federal Agencies, and Local Organizations

STATE Contact the Department of General Services, Procurement Division's (DGS-PD) Office of Small Business and DVBE Certification (OSDC) to obtain a list of certified DVBEs by telephone at (916) 322-5060 for the 24-hour automated telephone system or (916) 375-4940 for the receptionist during normal business hours. This information can also be obtained by searching the online database at <http://www.pd.dgs.ca.gov/smbus>. Begin by selecting Certified Firm Inquiry Services, then search by using either the Keyword Search or the Standard Query options. You must fully document this contact and describe the results on STD 840 (Side 2).

FEDERAL Search the U.S. Small Business Administration's (SBA) online database (Pro-Net) at <http://www.pro-net.sba.gov> to identify potential DVBEs. Select these minimum options in the following sequence: select Search Database, select CA under "State"; select Service Disabled Veteran under "Other Ownership Data"; and "Search Using These Criteria" at the page bottom. The database takes a few moments to query, and then your list will appear on your screen. You may select other criteria to focus your search. You must fully document this contact and describe the results on STD 840 (Side 2).

LOCAL Contact at least one local DVBE organization to identify DVBEs. For a list of local DVBE organizations, please refer to the DVBE Resource Packet that may be accessed online (<http://www.pd.dgs.ca.gov/smbus> - select "DVBE Resource Packet") or obtain a hardcopy by requesting it from DGS-PD Office of Small Business and DVBE Outreach and Education (see the Resources & Information page). You must fully document your contact with local DVBE organizations and describe the results on STD 840 (Side 2).

Step 3 Advertisements are mandatory unless waived by the awarding department.

CONTENT REQUIREMENTS: Include all of the following in your advertisement(s): (1) company name; (2) contact name; (3) address; (4) telephone and facsimile (if applicable) numbers; (5) e-mail address (if applicable); (6) the state's solicitation number(s); (7) goods and/or services for which the state is soliciting; (8) the location of the work to be performed; and (9) the State's bid(s) due date and/or your due date for receiving DVBE responses.

HOW MANY & WHERE TO PUBLISH: Bidders must publish two (2) ads, one (1) each in a trade paper and a DVBE focus paper unless the paper is dual purpose (fulfilling both trade and focus requirements as defined in California Code of Regulations, Title 2, Section 1896.61(k)), in which case one (1) ad is acceptable. Please see <http://www.pd.dgs.ca.gov/smbus> for a list of DVBE Trade and Focus Paper Listings.

WHEN: Ads must be published after the solicitation's release date and at least 14 days prior to the bid due date, unless a different time period is expressly established in this solicitation.

DOCUMENT & SUBMIT: On STD 840 (Side 2), document the publication name(s) in which you published advertisement(s), the contact name and phone number, and date of publication. Include a copy(ies) of the advertisement(s) with your bid.

Step 4 Invitations to Participate

WHO: Invite (solicit) DVBEs who can provide relevant goods and/or services to this solicitation to subcontract with you. Conducting Steps 1 through 3 produces a list of DVBEs from which you may choose potential DVBEs subcontractors/suppliers to contact. Bidders are advised to contact as many DVBEs (who provide relevant goods and/or services in the applicable location(s)) as possible. Non-California-certified DVBEs are not eligible -- please refer those DVBEs to the OSDC to learn about certification (see the Resources & Information page for contact information).

FOR WHAT: Solicit DVBEs for goods and/or services relevant to the state's solicitation. If you are unable to identify specific portion(s) of the proposed contract to subcontract, the state encourages bidders to avoid making a predetermination that no DVBEs are able to perform without first contacting and soliciting participation from them. This allows DVBEs to respond whether they can or cannot provide any goods or services related to the solicitation, and provides a bidder with responses for consideration.

HOW TO INVITE & CONTENT REQUIREMENTS: Written invitations are required. At a minimum, invitations must contain all of the following: (1) company name; (2) contact name; (3) address; (4) phone and facsimile (if applicable) numbers; (5) return e-mail address (if applicable); (6) the state's solicitation number (NOT APPLICABLE FOR DPR); (7) goods and/or services for which the state is soliciting; (8) location of work; and (9) the State's bid(s) due date and/or your due date for receiving DVBE responses.

WHEN: Provide DVBE's with a reasonable time period to receive and respond to your invitation, and to be considered by you for participation as described in Step 5, prior to your bid submission.

DOCUMENT & SUBMIT: Bidders must document the completed contacts on STD 840 (Side 1), Section A. Attach additional copies of STD 840A as necessary to list your DVBE contacts. You are required to attach a copy of (1) each invitation or offer sent by letter, fax or e-mail; and (2) confirmation of transmission and delivery. Your bid shall be considered non-responsive if it fails to include copies of the written invitations and delivery confirmations.

Step 5 Consider all responding DVBEs for contract participation. Consideration must be based on business needs for the contract and the same evaluation criteria must be applied to each potential DVBE subcontractor/supplier offering the same goods and services. You must document on STD 840 (Side 1), Section A any firm(s) selected for participation; or if not selected, the reason for non-selection. Attach additional copies of STD 840A as necessary to list all of your DVBE contacts.

OPTION C – THE DVBE BUSINESS UTILIZATION PLAN (BUP) option permits bidders to submit an approved DVBE BUP to satisfy DVBE participation solicitation requirements up to 3%. **DVBE BUPs apply only to solicitations for goods and information technology (IT) goods and services.** DVBE BUPs are a company's commitment to expend a minimum of 3% of its total statewide contract dollars with DVBEs -- this percentage is based on all of its contracts in the State, not just those with the State. DVBE BUPs must be submitted to and approved by the DGS-PD prior to the bid due date. Please call the DGS-PD, Office of Small Business and DVBE Outreach and Education for assistance. Bidders choosing this option must properly complete and submit STD 840 (Side 1) and include a copy of its approval letter with the bid; failure to submit these documents shall render your bid non-responsive.

RESOURCES AND INFORMATION

For assistance in preparing a responsive participation document, **contact the contracting official at the awarding department for this solicitation.** In accordance with Public Contract Code Section 10115.2(b)(3), bidders must advertise in trade and focus publications unless the requirement is waived. The Department of General Services, Procurement Division (DGS-PD) publishes a list of trade and focus publications to assist bidders in meeting these contract requirements. To obtain this list, please contact the DGS-PD Office of Small Business and DVBE Outreach and Education and request the "DVBE Resource Packet."

U.S. Small Business Administration (SBA)

Internet contact only – see instructions for website navigation
PRONET Database: <http://www.pro-net.sba.gov>

FOR:

Service-Disabled Veteran-owned businesses in California

(Remember to verify each DVBE's California certification.)

Local Organizations (see the DVBE Resource Packet available from DGS-PD DVBE Program Section listed below)

FOR:

List of potential DVBE subcontractors

DGS-PD Office of Small Business and DVBE Certification (OSDC)

707 Third Street, Room 400, West Sacramento, CA 95605
Website: <http://www.pd.dgs.ca.gov/smbus>
24-hour automated information
& document requests: (916) 322-5060
Receptionist: (916) 375-4940
Fax: (916) 375-4950

FOR:

**Directory of Certified DVBEs
Certification Applications
Certification Information
Certification Status, Concerns**

DGS-PD Office of Small Business and DVBE Outreach and Education

707 Third Street, 2nd Floor, West Sacramento, CA 95605
Voice, 8 am—5 pm: (800) 559-5529
Fax: (916) 375-4597

FOR:

**DVBE Program Participation Requirements
DVBE Program Info. and Statewide Policy
DVBE Resource Packet
DVBE Business Utilization Plan
Small Business/DVBE Advocates**

Advertisement Format Example

This example offers a suggested format that includes required information outlined in Option B, Good Faith Effort, Step 3. You can substitute the applicable information for the bolded, italicized words.

DVBEs are invited to participate as a potential subcontractor/supplier to perform a commercially useful function specific to **DGS' IFB No. 12345** for ***fencing materials in Chowchilla.***
DVBE responses due to me 1/1/02;
Bids due to the State 1/15/02.

Contact: **ABC Company**
Jane Doe, General Manager
123 Main Street, Sacramento, CA 95814
voice: **555/555-5555**; fax: **555/555-5556**
or e-mail: ***jane.doe@abcco.com***

Commercially Useful Function Definition

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 Section 1896.61(f); is certified in accordance with Section 1896.70; and provides services or goods that contribute to the fulfillment of the contract requirements by performing a commercially useful function. A DVBE contractor, subcontractor or supplier is considered performing a commercially useful function when it meets the following criteria:

(1) The business concern is: responsible for the execution of a distinct element of the work of the contract; carrying out its obligation by actually performing, managing or supervising the work involved; and performing work that is normal for its business services and functions, and

(2) The business concern is not further subcontracting a greater portion of the work than would be expected by normal industry practices.

DOCUMENTATION OF DISABLED VETERAN BUSINESS ENTERPRISE PROGRAM REQUIREMENTS

STD 840 (REV. 9-15-2003)

Designation Of Option Check the appropriate box(es) to indicate the option(s) with which you choose to comply, complete the applicable sections and attach the required supporting documentation. You are advised to read all instructions carefully prior to completing this form. Remember that only California certified DVBEs who can provide related goods and/or services may be used to satisfy these program solicitation requirements.

- ☐ **OPTION A – I commit to meeting the full DVBE contract participation requirement.**
Complete STD 840, Section A.
- ☐ **OPTION B – I performed and documented a Good Faith Effort (GFE) in an attempt to obtain DVBE participation.**
Complete STD 840, Section A (for GFE Steps 4 & 5) and STD 840 (REVERSE), Section B (for GFE Steps 1–3).
- ☐ **OPTION C – I submit a copy of my firm's "Notice of Approved DVBE Business Utilization Plan."**

A. Full information must be provided.

For contract participation commitment, at least one DVBE must be listed. DVBEs must perform a commercially useful function. List the specific goods and/or services with the dollar and/or percentage value(s) that the DVBE(s) commit(s) to provide and the DVBE's tier (prime contractor = 0, subcontractor to prime contractor = 1, subcontractor to Tier 1 subcontractor = 2, etc.). If both the estimated dollar amount and percentage are listed, the higher value supercedes. Attach additional pages to list all other DVBE subcontractors/suppliers (you may use STD 840A). During contract performance, all requests for substituting named DVBEs must be made in accordance with the provisions of California Code of Regulations, Title 2, Section 1896.64(c).

For Good Faith Effort (GFE), use this section to document your first completed contacts with (Step 4), and consideration of (Step 5), relevant DVBEs. Business reasons for non-selection must be documented. Attach additional pages to list all other DVBE contacts (you may use STD 840A). Copies of all written invitations and delivery confirmations must also be attached and submitted with the bid.

BOTH SECTIONS MUST BE COMPLETED FOR GOOD FAITH EFFORT	AT LEAST ONE DVBE MUST BE NAMED FOR PARTICIPATION	Date Contacted / /	DVBE Company Name (If you are the Prime and a DVBE enter your name, otherwise enter the solicited subcontractor.)			
		DVBE Contact Name & Reference #	Telephone Number ()	Fax Number ()	E-mail (if available)	
		Street Address, City, State and Zip Code				
		☐ Yes, I am, or I will subcontract with, the listed DVBE to provide the following goods and/or services:				
		Specific Goods and/or Services		Estimated \$ and/or % \$ / %	Tier	
		OR	☐ No, I am unable to subcontract with the DVBE for the following business reasons:			
		Date Contacted / /	DVBE Company Name			
		DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)	
		Street Address, City, State and Zip Code				
OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:					
	Specific Goods and/or Services		Estimated \$ and/or % \$ / %	Tier		
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:					

ATTACH ADDITIONAL PAGES (OR USE STD 840A) TO LIST ALL OTHER DVBE CONTACTS

Go to Side 2, Section B to continue Good Faith Effort documentation ⇨

ADDITIONAL DISABLED VETERAN BUSINESS ENTERPRISE CONTACTS

STD 840A (EST. 9-15-2003)

- B. Documentation of Good Faith Effort Steps 1, 2 and 3**—Remember to carefully read all instructions prior to completing this form. Please refer to the Resources & Information page for detailed contact information and a sample advertisement format.

STEP 1. Contact the Awarding Department (the contracting official, unless another contact is specified) to identify potential DVBE subcontractors/suppliers, **and document this contact as required.**

Date / /	Contact Name: <i>ATTENTION BIDDERS: CONTACT JAN VANDERBECK</i>	Telephone Number (916) 654-9788
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Describe Result

STEP 2. Contact all of the following and document your contacts as required: Other state and federal agencies and local organizations to identify potential DVBE subcontractors/suppliers.

Other State Agency – Procurement Division, Office of Small Business and DVBE Certification (Certification Office)

PHONE CONTACT OR ONLINE SEARCH	Date / /	Telephone Number (916) 375-4940	Contact Name	☐ I contacted the Certification Office for a list of California certified DVBEs.
	Date / /	Internet Address http://www.pd.dgs.ca.gov/smbus		☐ I searched the Certification Office's online database to identify California certified DVBEs.

Describe Result

Federal Agency – U.S. Small Business Administration (SBA) online database

Date / /	Internet Address http://www.pro-net.sba.gov	☐ I searched the federal online database for California DVBEs.
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Describe Result

Local DVBE Organizations – Contact at least one local DVBE organization—refer to the DVBE Resource Packet for a list of acceptable contacts. (<http://www.pd.dgs.ca.gov/smbus> - select “DVBE Resource Packet”)

Date / /	Organization Name	Contact Name	Telephone Number and/or Internet Address () http://www.
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Describe Result

Date / /	Organization Name	Contact Name	Telephone Number and/or Internet Address () http://www.
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Describe Result

STEP 3. Publish advertisements: Two (2) advertisements: One (1) ad in an accepted trade paper; and one (1) ad in an accepted DVBE focus paper (please see the DVBE Trade and Focus Paper listings for a list of all accepted publications); unless the paper is dual purpose (fulfilling both trade and focus requirements), in which case one (1) ad is acceptable. **Document this step as required and remember to attach a copy of your advertisement(s).**

Focus Paper Name (list full name)		Contact Name	Telephone Number ()
Address		Date Ad Published / /	
Trade Paper Name (list full name)		Contact Name	Telephone Number ()
Address		Date Ad Published / /	

☐ I certify the ad was placed to reach both trade and focus audiences through this one publication.

Trade and Focus Paper Name (list full name)		Contact Name	Telephone Number ()
Address		Date Ad Published / /	

ADDITIONAL DISABLED VETERAN BUSINESS ENTERPRISE CONTACTS

STD 840A (EST. 9-15-2003)

This document may be used as a continuation from Section A, STD 840 (REV. 9-15-2003)

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

ADDITIONAL DISABLED VETERAN BUSINESS ENTERPRISE CONTACTS

STD 840A (EST. 9-15-2003) (REVERSE)

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

Date Contacted / /	DVBE Company Name		
DVBE Contact Name	Telephone Number ()	Fax Number ()	E-mail (if available)
Street Address, City, State and Zip Code			

OR	☐ Yes, I will subcontract with the listed DVBE to provide the following goods and/or services:		
	Specific Goods and/or Services	Estimated \$ and/or % \$ / %	Tier
	☐ No, I am unable to subcontract with the DVBE for the following business reasons:		

DVBE Program Requirements Supplier Checklist (REV. 9-15-2003)

Please do not submit this checklist with your bid. It is provided for your use only. Checking every box of your elected compliance option does not guarantee that your bid will be evaluated compliant.

☐ **OPTION A: COMMITMENT TO DVBE CONTRACT PARTICIPATION**

- ☐ STD 840 included with bid
- ☐ DVBE Written Agreement
- ☐ Designated the Commitment Option – Checked the first box
- ☐ Listed at least one California certified DVBE subcontractor
- ☐ Checked the box(es) for “Yes ...”
- ☐ Listed specific goods and/or services DVBE(s) agrees to provide
- ☐ Proposed DVBE contract performance is a “commercially useful function” relevant to the contract
- ☐ Listed the estimated dollar amount and/or percentage of contract for the DVBE’s participation
- ☐ Proposed DVBE participation meets the 3% requirement (unless a different percentage is specified)
- ☐ Attached a copy of the DVBE’s certification letter from the Department of General Services

☐ **OPTION B: GOOD FAITH EFFORT (GFE)**

- ☐ STD 840 included with bid
- ☐ Designated the GFE Option – Checked the second box
- ☐ (Step 4) Listed all DVBEs contacted and invited to perform on the proposed contract
- ☐ Confirmed that listed DVBEs are California certified
- ☐ Attached copies of the invitations sent to the listed DVBEs
- ☐ Invitations included the required contact information
- ☐ Attached copies of the delivery confirmations for invitations to DVBEs (e.g. mail receipts, fax confirmations, etc.)
- ☐ (Step 5) Checked the “No” boxes and listed the business reasons for non-selection of DVBEs contacted
- ☐ (Step 1) Contacted the Awarding Department and listed contact and results
- ☐ (Step 2) Contacted Other State agency (Office of Small Business and DVBE Certification) and listed the contact and results
- ☐ (Step 2) Searched the Federal Pro-net internet database and noted the results
- ☐ (Step 2) Contacted Local DVBE Organization(s) and listed the contact and results
- ☐ (Step 3) Advertised – IF NOT WAIVED
 - Listed full information for the advertisement(s) and publication(s)
[2 ads in one trade and in one DVBE focus publication; **OR** 1 ad in one dual-purpose publication]
- ☐ Attached a copy of the advertisement(s)
- ☐ The advertisement(s) were published at least 14 days prior to the bid due date
- ☐ The advertisement(s) included my required contact information

☐ **OPTION C: BUSINESS UTILIZATION PLAN (BUP)**

- ☐ **Prior to the bid due date** -- Submitted a BUP to DGS-PD and received approval
- ☐ STD 840 included with bid
- ☐ Designated the BUP Option – Checked the third box
- ☐ Attached a copy of the BUP Approval letter from DGS-PD

DISABLED VETERAN BUSINESS ENTERPRISE DECLARATIONS

STD. 843 (Rev. 11/2005)

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: _____

PO/Contract Description (materials/supplies/services/equipment): _____

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.)*

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 Number of Owner)

(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)

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

**NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY
BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS**

STATE OF CALIFORNIA)
) ss
COUNTY OF _____)

(Name)

(Position title)

(The bidder)

the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation, that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that 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, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

DATED: _____

By _____
(Person signing for bidder)

Subscribed and sworn to

before me on _____

(Notarial Seal)

(Notary Public)

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)

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

SMALL BUSINESS PREFERENCE AND CERTIFICATION REQUEST
(For Construction Contractors Only)

STD. 811 (REV 6-2001)(CA ST PKS, EXCEL 2/25/2009)

READ BEFORE SIGNING
(THIS REQUEST MUST REMAIN WITH THE BID PACKAGE)• **1. PENALTY ASSESSMENT**

A business will be assessed a penalty and be ineligible to transact any business with the Department for furnishing incorrect information. (Title 2 of the California Code of Regulations)

• **2. ~~PUBLIC WORKS AGREEMENTS EXCEEDING \$100,000 AND REQUIRING TYPES "A" OR "B" CONTRACTORS LICENSE~~**

~~On public works agreements where the lowest responsible bid exceeds \$100,000, and the work to be performed requires a type "A" or "B" contractor's license and two or more subcontractors will be used, preferences shall only be granted to those small business bidders who certify, under penalty of perjury, that at least fifty percent (50%) of subcontractors utilized on the job are certified small businesses. In meeting the 50% requirement, bidders may use certified small business and/or small businesses that have applied for certification no later than 5:00 P.M. on the bid opening date and are subsequently granted certification. The 50% small business subcontractor utilization level shall be maintained through the term of the contract.~~

• **3. JOINT BIDDERS/COMBINATION BIDDERS**

Bidders bidding jointly or as a combination of several business organizations are especially cautioned that such bidders must be jointly licensed and approved in the form and style in which the bid is executed

• **4. NAME STYLE**

The Small Business Preference and Certification Request must be signed in the same name style in which the bidder is licensed by the Contractors' State License Board.

BIDDER'S(S) LEGAL NAME STYLE

FEDERAL EMPLOYER IDENTIFICATION NUMBER

OSBCR CERTIFICATION NUMBER

CERTIFICATION

- **5.** The undersigned hereby requests preference as a "SMALL BUSINESS" and further certifies under penalty of perjury, that the firm still meets the requirements of Section 1896(L) Title 2 of the California Code of Regulations. A completed form STD. 813 meeting all applicable requirements must be on file in the Office of Small Business Certification and Resources (OSBCR) by 5:00 p.m. of the bid opening date. The form STD. 813 may be obtained from the OSBCR Office at 1531 I Street, Second Floor, Sacramento, CA or can be downloaded at www.dgs.ca.gov/osbcr.

BIDDER'S SIGNATURE

DATE SIGNED

• **6. BIDDERS RECEIVING BONDING ASSISTANCE**

In the event the bidder has received assistance in obtaining bonding for this project, he/she shall set forth the name and nature of the firm providing such assistance. Should the firm be listed as a subcontractor, bidder shall set forth the percentage of the contract to be performed by the subcontractor.

NAME OF FIRM PROVIDING BONDING ASSISTANCE

NATURE OF FIRM PROVIDING BONDING ASSISTANCE

SUBCONTRACTOR ASSISTANCE

☐ YES - Percentage _____☐ NO

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



DARFUR CONTRACTING ACT CERTIFICATION

Pursuant to Public Contract Code section 10478, if a bidder or proposer currently or within the previous three years has had business activities or other operations outside of the United States, it must certify that it is not a "scrutinized" company as defined in Public Contract Code section 10476.

Therefore, to be eligible to submit a bid or proposal, please complete only one of the following three paragraphs (via initials for Paragraph # 1 or Paragraph # 2, or via initials and certification for Paragraph # 3):

1. _____ We do not currently have, or we have not had within the previous three
Initials years, business activities or other operations outside of the United States.

OR

2. _____ We are a scrutinized company as defined in Public Contract Code section
Initials 10476, but we have received written permission from the Department of General Services (DGS) 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.

OR

3. _____ We currently have, or we have had within the previous three years,
Initials business activities or other operations outside of the United States, but we
+ certification certify below that we are not a scrutinized company as defined in Public
below Contract Code section 10476.

CERTIFICATION For #3

I, the official named below, CERTIFY UNDER PENALTY OF PERJURY that I am duly authorized to legally bind the prospective proposer/bidder to the clause listed above in # 3. This certification is made under the laws of the State of California.

PROPOSER/BIDDER FIRM NAME (Printed)		FEDERAL ID NUMBER
BY (Authorized Signature) ▶		
PRINTED NAME AND TITLE OF PERSON SIGNING		
DATE EXECUTED	EXECUTED IN THE COUNTY AND STATE OF	

YOUR BID OR PROPOSAL WILL BE DISQUALIFIED UNLESS YOUR BID OR PROPOSAL INCLUDES THIS FORM WITH EITHER PARAGRAPH #1 OR #2 INITIALED, OR PARAGRAPH #3 INITIALED AND CERTIFIED.

STANDARD AGREEMENT

STD 213[PW] (Rev 06/03)(CA ST PKS, EXCEL 10/20/2004)

AGREEMENT NUMBER

REGISTRATION NUMBER

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

STATE AGENCY'S NAME

CONTRACTOR'S NAME

2. The term of this Agreement is: _____ through _____

3. The maximum amount \$ _____ of this Agreement is:

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.

Exhibit A - Scope of Work _____ page(s)

Exhibit B - Budget Detail and Payment Provisions _____ page(s)

Exhibit C* - General Terms and Conditions _____ page(s)

Check mark one item below as Exhibit D:

☐
☐

Exhibit - D Special Terms and Conditions (Attached hereto as part of this agreement)

_____ page(s)

Exhibit D, Attachment 1 - Project Manual

_____ pages

Exhibit E - Additional Provisions

_____ pages

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 www.ols.dgs.ca.gov/Standard+Language

IN WITNESS WHEREOF, this Agreement has been executed by the parties hereto.

CONTRACTOR

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

BY (Authorized Signature)

DATE SIGNED(Do not type)



PRINTED NAME AND TITLE OF PERSON SIGNING

ADDRESS

STATE OF CALIFORNIA

AGENCY NAME

BY (Authorized Signature)

DATE SIGNED(Do not type)



PRINTED NAME AND TITLE OF PERSON SIGNING

ADDRESS

**California Department of General
Services Use Only**

☐ Exempt per:

Contractor's Name:
Agreement Number:
Page: _____ of _____

**EXHIBIT A — Public Works
(Standard Agreement)**

SCOPE OF WORK

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

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:	

**EXHIBIT B — PUBLIC WORKS
(Standard Agreement)**

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:

State's Representative's Name
State's Rep Service Center
Service Center Address
Service Center City/State/Zip

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.

Ten percent (10%) 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.

Contractor's Name:

Agreement Number:

Page: 1 of 1

**EXHIBIT D — PUBLIC WORKS
(Standard Agreement)**

SPECIAL TERMS AND CONDITIONS

1. Project Manual

The Project Manual, marked Exhibit D, Attachment I, containing instructions to bidders, 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.

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.

SAMPLE

PAYMENT BOND TO ACCOMPANY CONSTRUCTION CONTRACT
(CIVIL CODE SECTION 3247)

BOND NO. _____

The premium on this bond is _____ for the term _____

Know All Men By These Presents:

That The State of California, acting by and through the _____

has awarded to _____ whose address is _____

(CONTRACTOR / PRINCIPLE)

_____ as Principle, a contract for the work described as follows:

WHEREAS, The provisions of Civil Code Section 3247 require that the Principle file a bond in connection with said contract and this bond is executed and tendered in accordance therewith.

NOW THEREFORE, Principle and _____, a corporation organized
under the laws of _____ (SURETY)

, and authorized to transact a general surety business in the State 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.

THE CONDITION OF THIS OBLIGATION IS SUCH,

1. That if said Principle or its subcontractors shall fail to pay any of the persons named in Civil Code Section 3181, 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 Principle 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 brought upon this bond, the Surety will pay a reasonable attorney's fee to be fixed by the court.

2. This bond shall insure to the benefit of any persons named in Civil Code Section 3181 as to give a right of action to such persons or their assigns 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. The bond is executed by the Surety, to comply with the provisions of Chapter 7, Title 15, Part 4, Division 3 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)

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

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

under the laws of the State of California.

(SIGNATURE OF ATTORNEY IN FACT)

(PRINTED OR TYPED NAME OF 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 _____ 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:

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 _____ and No Cents (\$_____) 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.

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

Name of Surety

(Seal)

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

PAYEE DATA RECORD

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

STD. 204 (Rev. 6-2003)(CA ST PKS, EXCEL 9/22/2004)

1	INSTRUCTIONS: Complete all information on this form. Sign, date, and return to the State agency (department/office) address shown at the bottom of this page. Prompt return of this fully completed form will prevent delays when processing payments. Information provided in this form will be used by State agencies to prepare Information Returns (1099). See reverse side for more information and Privacy Statement. NOTE: Governmental entities, federal, State, and local (including school districts), are not required to submit this form.		
2	PAYEE'S LEGAL BUSINESS NAME (Type or Print) SOLE PROPRIETOR – ENTER NAME AS SHOWN ON SSN (Last, First, M.I.) MAILING ADDRESS CITY, STATE, ZIP CODE EMAIL ADDRESS BUSINESS ADDRESS CITY, STATE, ZIP CODE 		
3	PAYEE ENTITY TYPE CHECK ONE BOX ONLY	ENTER FEDERAL EMPLOYER IDENTIFICATION NUMBER (FEIN): - ☐ PARTNERSHIP ☐ ESTATE OR TRUST CORPORATION: ☐ MEDICAL (e.g., dentistry, psychotherapy, chiropractic, etc.) ☐ LEGAL (e.g., attorney services) ☐ EXEMPT (nonprofit) ☐ ALL OTHERS ☐ INDIVIDUAL OR SOLE PROPRIETOR ENTER SOCIAL SECURITY NUMBER: - (SSN required by authority of California Revenue and Tax Code Section 18646)	NOTE: Payment will not be processed without an accompanying taxpayer I.D. number.
4	PAYEE RESIDENCY STATUS ☐ California resident - Qualified to do business in California or maintains a permanent place of business in California. ☐ California nonresident (see reverse side) - 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 attached.		
5	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. AUTHORIZED PAYEE REPRESENTATIVE'S NAME (Type or Print) TITLE SIGNATURE DATE TELEPHONE 		
6	Please return completed form to: Department/Office: _____ Unit/Section: _____ Mailing Address: _____ City/State/Zip: _____ Telephone: (____) _____ Fax: (____) _____ E-mail Address: _____		

PAYEE DATA RECORD

STD. 204 (Rev. 6-2003)(REVERSE)(CA ST PKS, EXCEL 9/22/2004)

1	<u>Requirement to Complete Payee Data Record, STD. 204</u> A completed Payee Data Record, STD. 204, is required for payments to all non-governmental entities and will be kept on file at each State agency. Since each State agency with which you do business must have a separate STD. 204 on file, it is possible for a payee to receive this form from various State agencies. Payees who do not wish to complete the STD. 204 may elect to not 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 backup withholding and nonresident State income tax withholding. Amounts reported on Information Returns (1099) are in accordance with the Internal Revenue Code and the California Revenue and Taxation Code								
2	Enter the payee's legal business name. Sole proprietorships must also include the owner's full name. An individual must list his/her full name. The mailing address should be the address at which the payee chooses to receive correspondence. Do not enter payment address or lock box information here.								
3	Check the box that corresponds to the payee business type. Check only one box. Corporations must check the box that identifies the type of corporation. 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 the California Revenue and Taxation Code Section 18646 to facilitate tax compliance enforcement activities and the preparation of Form 1099 and other information returns as required by the Internal Revenue Code Section 6109(a). The TIN for individuals and sole proprietorships is the Social Security Number (SSN). Only partnerships, estates, trusts, and corporations will enter their Federal Employer Identification Number (FEIN).								
4	<u>Are you a California resident or nonresident?</u> 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. Payments to all nonresidents may be subject to withholding. Nonresident payees performing services in California or receiving rent, lease, or royalty payments from property (real or personal) located in California will have 7% of their total payments withheld for State income taxes. However, no withholding is required if total payments to the payee are \$1,500 or less for the calendar year. For information on Nonresident Withholding, contact the Franchise Tax Board at the numbers listed below: <table border="0"> <tr> <td>Withholding Services and Compliance Section:</td> <td>1-888-792-4900</td> <td>E-mail address:</td> <td>wscs.gen@ftb.ca.gov</td> </tr> <tr> <td>For hearing impaired with TDD, call:</td> <td>1-800-822-6268</td> <td>Website:</td> <td>www.ftb.ca.gov</td> </tr> </table>	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
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						
5	Provide the name, title, signature, and telephone number of the individual completing this form. Provide the date the form was completed.								
6	This section must be completed by the State agency requesting the STD. 204.								
	<u>Privacy Statement</u> 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.								

SECTION 00700 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 bodily injury, property damage, and personal injury with limits not less than one million dollars (\$1,000,000) per occurrence and two million dollars (\$2,000,000) general 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.
- (3) Motor Vehicle Liability Insurance: Contractor shall maintain motor vehicle liability insurance with limits not less than one million dollars (\$1,000,000) per 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 Workers' Compensation and Employers' Liability Insurance for all of Contractor's employees who will be engaged in the performance of Work on Property, including special coverage extensions where applicable. Contractor is required to meet all requirements as stated in California Labor Code, Section 3700.

- 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 thirty (30) 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; (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.

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) Upon notification by State 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.
- (3) Upon State's request, Contractor shall provide copies of its Workers' Compensation and Employers' Liability Insurance.

- 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 TWO HUNDRED FIFTY DOLLARS (\$250.00) 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) Ten percent (10%) shall be retained from each progress payment and held by State. After the Punch List has been issued, retainage may be adjusted to 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 ten percent (10%) 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 excrow 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 than 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 00802
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)
 2. Section 00804 – Disposal of Refuse
 3. Section 01250 – Contract Modification Procedures
 4. Section 01290 – Payment Procedures
 5. Section 01330 – Submittal Procedures
 6. Section 01420 – References
 7. Section 01770 – Closeout Procedures
- 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 Architect's and Contractor's services and expenses required as a result of such insured loss.

ADD the following paragraph to Section 0070 – General Conditions (DPR 483), 1.04 Insurance, (5) POLLUTION LIABILITY:

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.

PART 2 - PRODUCTS (not used)

PART 3 - EXECUTION (not used)

END OF SECTION 00802

SECTION 00803
MINED PRODUCTS AND MATERIALS

PART 1 - GENERAL

1.1 DESCRIPTION

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

1.2 RELATED WORK

- A. Related Sections include, but are not limited to, the following:

1. 02300 EARTHWORK
2. 02741 HOT-MIX ASPHALT PAVING
3. 02751 CEMENT CONCRETE PAVEMENT
4. 03300 CAST-IN-PLACE CONCRETE

PART 2 - PRODUCTS

2.1 MINED PRODUCTS AND MATERIALS

- A. In accordance with provisions of Section 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 CERTIFICATE 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 Section 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 00803

SECTION 00804
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 00804

SECTION 00810 CONSTRAINTS AND MITIGATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

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

PART 2 – PRODUCTS (not used)

PART 3 – EXECUTION

3.1 CONSTRAINTS AND MITIGATIONS

- A. The Department of Parks and Recreation has completed an environmental review process governed by the various rules, regulations, and codes of the State of California. In compliance with the environmental review document, the Contractor's operations are subject to the following constraints and environmental protection measures. In addition to these, the Contractor is responsible for compliance with any and all constraints or environmental protection measures that may be noted in other sections of the Technical Specifications.
- B. The contractor's operations are subject to the following constraints and mitigations:
 - 1. Contractor will provide a water truck and be available during all ground-disturbing activities in order to prevent an increase in dust levels. Soil in disturbed areas shall be watered as needed to keep dust levels within acceptable levels.
 - 2. Contractor shall install and maintain protective orange plastic fencing around the elderberry shrub at twenty feet from the shrub drip line. area until all construction activities are completed. After construction activities are completed, the Contractor shall remove fencing.

3.2 SITE CONDITIONS

- A. Coordination with State's Representative

1. Contractor shall contact the State's Representative at least five (5) working days in advance of the start of construction activities.

B. Limit of Work

1. Contractor shall layout all planned ground disturbance work for review and approval prior to such work commencing.
2. Contractor shall avoid all ground-disturbing activities that may affect natural resources . See Section 02231 Tree Protection and Trimming.

C. Role of Environmental Scientist/Natural Resource Specialist

1. The DPR Environmental Scientist will review native vegetation protection measures prior to the start of construction activities near these resources and will conduct periodic monitoring thereafter, at their discretion.

D. Cultural Resources

1. Contractor shall immediately contact the State's Representative in the event that cultural resources (including but not limited to dark soil containing shell, bone, flaked stone, groundstone, or deposits of milled wood, metal, glass and ceramics) are encountered during project construction by anyone. Contractor shall be re-directed to other project tasks
2. In the event that human remains are discovered, work shall cease immediately in the area of the find and the Contractor shall notify the State's Representative. Contractor shall be re-directed to other project tasks

E. Down Time

1. If unforeseen cultural/natural resources are uncovered during execution of the work, the State's Representative will put work on hold at that specific location, and Contractor(s) will be redirected to other tasks. The archaeologist/cultural/natural specialist will record and evaluate the find and implement avoidance, preservation, or recovery measures as appropriate in compliance with environmental law and department resource directives prior to State's Representative directing resumption of work at that specific location.
2. 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.

3.3 PROTECTION OF EXISTING RESOURCES

- A. Provide and maintain required protection, in areas identified on drawings, or as directed by State's Representative in order to maintain integrity of the resources to be protected during the course of the project.

END OF SECTION 00810

SECTION 01100 SUMMARY

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Information:

1. Owner: State of California, Department of Parks and Recreation.
2. Park District: Twin Cities District
3. Park Unit: Prairie City SVRA
Location: 13300 White Rock Road, Rancho Cordova, CA 95742

- B. Refer to Notice to Contractors included in Project Manual for a general description of the work.

1.2 WORK PHASING AND SEQUENCE (Not Used)

1.3 USE OF PROJECT SITE

- A. General: The project site is limited to the areas indicated, and the Contractor shall limit operations to the project 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 The State's right to perform work or to retain other contractors on portions of Project or as directed by State's Representative. Rules and regulations for state park systems are found in Title 14 California Code of Regulations, Division 3, Chapters 1 and 2.

1.4 WORK UNDER OTHER CONTRACTS (Not Used)

1.5 FUTURE WORK (Not Used)

1.6 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Format: The Specifications are organized into Divisions and Sections using the 16-division format and CSI/CSC's "MasterFormat" numbering system.

- B. 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. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred as the sense requires. Singular words shall be interpreted as plural, and

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plural words shall be interpreted as singular where applicable as the context of the Contract Documents indicates.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01100

SECTION 01140 WORK RESTRICTIONS

PART 1 - GENERAL

1.1 **USE OF PROJECT SITE** Use of Site: Limit operations to work in areas indicated. Do not disturb portions of project site beyond areas indicated.

1. Limits: Confine constructions operations to the areas indicated.
2. State Occupancy: Allow for State occupancy of site and use by the public.
3. The Prairie City Quarter Midget Track facility has an on-gong and a predetermined event schedule. The State will require the use of the track and other parts of the facility for weekend use. The event schedule and the State's use of parts of the facility during the construction period shall be coordinated with the State's Representative upon the start of construction.
4. Driveways and Entrances: Keep driveways and entrances serving the project site clear and available to The State, State's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
 - a. Schedule deliveries to minimize use of driveways and entrances.

B. Use of Existing Facilities: Maintain existing facilities in a weathertight condition throughout construction period. Repair damage caused by construction operations. Protect facilities and occupants during construction period.

1.2 SPECIAL REQUIREMENTS

A. On-site construction activities shall not take place until after September 27, 2009.

1.3 OCCUPANCY REQUIREMENTS

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01140

SECTION 01250 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

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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 01250

SECTION 01290 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..

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- 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 01290

SECTION 01330 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.

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: Six copies of each submittal must be 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.

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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 submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. 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 Action Submittals required by individual Specification Sections.
 - 1. Number of Copies: Submit six copies of each submittal, unless otherwise indicated. The State Representative will return two copies. Mark up and retain one returned copy as a Project Record Document.
- 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.

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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.
 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 six (6) copies of each submittal, unless otherwise indicated. The State Representative will return two (2) copies.
 - 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. 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.
- D. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements and, where required, is authorized for this specific Project.
- E. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements. Include evidence of manufacturing experience where required.
- F. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements.
- G. 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.
- H. 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.
- I. 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.

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- J. 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.
- K. 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.
- L. Maintenance Data: Submit written and graphic instructions and procedures for operation and normal maintenance of products and equipment.
- M. 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.
- N. 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.
- O. 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 01330

SECTION 01400 QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Contractor shall arrange and pay for a qualified independent testing agency to perform all required testing for the Project. Test reports shall be submitted to the State's Representative within forty-eight (48) hours.
- C. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specified tests, inspections, and related actions do not limit Contractor's quality-control efforts as necessary to provide compliance with the Contract Document requirements.
 - 2. Requirements for Contractor to provide quality-control services required by the State, or authorities having jurisdiction are not limited by provisions of this Section.

1.2 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions before, during and after execution of the Work to evaluate that completed construction complies with requirements. Quality Control Services do not include contract enforcement activities performed by the State or Designer of Record.
- C. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

1.3 DELEGATED DESIGN

- 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.

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1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to the State's Representative.

1.4 SUBMITTALS

- A. Qualification Data: 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.
- B. Delegated-Design Submittal: In addition to Shop Drawings, Product Data, and other required submittals, 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.
- C. Contractor's Daily Quality Control Reports: The Contractor shall designate an individual responsible for maintaining control over the quality of the work. For each day on which work is scheduled to be performed, the Contractor's Quality Control Representative shall Prepare and submit certified written reports that include the following:
 1. Date of report preparation and date work was performed.
 2. Project title and number.
 3. Name, address, and telephone number of testing agency.
 4. Dates and locations of samples, tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work performed that day, and reasons for non-work.
 7. Item of work tested or inspected. Test and inspection methods.
 8. Identification of products delivered/installed and corresponding Specification Sections.
 9. Complete test or inspection data.
 10. Test and inspection results and an interpretation of test results.
 11. Weather conditions. Ambient conditions at time of sample taking , testing and inspecting.
 12. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 13. Name and signature of Quality Control Representative, and laboratory inspector.
 14. Recommendations on retesting and reinspecting.
- D. Permits, Licenses, and Certificates: For the State's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence,

records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.5 QUALITY ASSURANCE

- A. 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.
- B. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- C. Installer Qualifications: A firm or individual experienced in installing, erecting, 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.
- D. 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.
- 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 to those indicated for this Project in material, design, and extent.
- F. Specialists: Certain sections of the Specifications may 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. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.
- G. Testing Agency Qualifications: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.

1.6 QUALITY CONTROL

- A. Contractor Responsibilities: The Contractor is solely responsible for controlling the work to comply with the Contract Documents. Unless otherwise indicated,

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provide quality-control services specified and required by authorities having jurisdiction.

1. Where testing or inspection services are indicated, engage a qualified testing agency to perform these quality-control services.
 2. Notify the State Representative, State's testing agencies, Inspector of Record, and Contractor's testing agencies at least 48 hours in advance of time when Work that requires testing or inspecting will be performed.
 3. Testing or inspection services are the Contractor's responsibility; submit a certified written report, in duplicate, of each testing or inspection service.
 4. Testing and inspecting 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.
- B. Special Tests and Inspections: The Contractor will engage a testing agency to conduct special tests and inspections required by authorities having jurisdiction.
1. Testing agency will notify the State's Representative and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 2. Testing agency will submit a certified written report of each test, inspection, and similar quality-control service to the State's Representative with copy to Contractor and to authorities having jurisdiction.
 3. Testing agency will submit a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 4. Testing agency will interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
 5. Testing agency will retest and reinspect corrected work.
- C. 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.
- D. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that revised or replaced Work that failed to comply with requirements established by the Contract Documents.
- E. Testing Agency Responsibilities: Cooperate with the State's Representative and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify the State and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.

2. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
 3. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 4. Do not release, revoke, alter, or increase requirements of the Contract Documents or approve or accept any portion of the Work.
 5. Do not perform any duties of Contractor.
- F. Associated Services: Cooperate with agencies 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 inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field-curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.
- G. 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 inspecting.
1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
1. Provide materials and comply with installation requirements specified in other Sections of these Specifications. Restore patched areas and extend restoration into adjoining areas in a manner that eliminates evidence of patching.
- B. Protect construction exposed by or for quality-control service activities.

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- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01400

SECTION 01420 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.

References

- 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

References

	(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)

References

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)

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References

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

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01420

SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Contractor may elect to provide a temporary construction office and utilities. The following requirements apply if these facilities are to be provided.
- C. Site is subject to continual public use. Facilities shall be safe and secure at all times.

1.2 DEFINITIONS

- A. Permanent Enclosure: As determined by the State , permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.3 TEMPORARY UTILITIES

- A. General: Cost or use charges for temporary facilities are not chargeable to the State and shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the State's construction forces, testing and inspecting agencies and personnel of authorities having jurisdiction.
- B. Water Service: Use water from the State's existing water system without metering and without payment of use charges. Paragraphs above and below assume services are available and Owner will permit tapping into existing system without charge.
- C. Electric Power Service: Use electric power from the State's existing system without metering and without payment of use charges.

1.4 SUBMITTALS

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

1.5 QUALITY ASSURANCE

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Temporary Facilities and Controls

- A. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.
 - 1. 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.

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to the State, change over from use of temporary service to use of permanent service.
 - 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before the State's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
 - 1. Keep temporary services and facilities clean and neat.
 - 2. Relocate temporary services and facilities as required by progress of the Work.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved. Provide materials suitable for use intended.
- B. Portable Chain-Link Fencing: Minimum 2-inch 9-gage, galvanized steel, chain-link fabric fencing; minimum 6 feet high with galvanized steel pipe posts; minimum 2-3/8-inch OD line posts and 2-7/8-inch OD corner and pull posts, with 1-5/8-inch OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts as directed.
- C. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.
- D. Water: Potable.

2.2 EQUIPMENT

- A. Field Offices: Prefabricated, mobile units, with lockable entrances, operable windows, and serviceable finishes; heated and air conditioned; on foundations adequate for normal loading.
- B. Fire Extinguishers: Hand carried, portable, UL rated. Provide class and extinguishing agent as indicated or a combination of extinguishers of NFPA-recommended classes for exposures.
 - 1. Comply with Title 19 CCR, Division 1, Chapter 3; and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- C. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.
- D. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

PART 3 - EXECUTION

3.1 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.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company, the State, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services. Provide minimum 48 hours advance written notice.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked-in services.
 - 3. Obtain easements to bring temporary utilities to Project site where the State's easements cannot be used for that purpose.

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Temporary Facilities and Controls

- B. Water Service: Use of the State's existing water service facilities may be permitted, at the direction of the State's Representative, as long as facilities are cleaned and maintained in a condition acceptable to the State. At Substantial Completion, restore these facilities to condition existing before initial use.
 - 1. Provide rubber hoses as necessary to serve Project site.
 - 2. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
- C. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking-water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.
 - 1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 - 2. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy.
- D. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment from that specified that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- E. Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.
 - 1. Install power distribution wiring overhead and rise vertically where least exposed to damage.
- F. Electric Power Service: Use of the State's existing electric power service may be permitted, at the direction of the State's Representative, as long as equipment is maintained in a condition acceptable to the State.
- G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment.
 - 1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.

3.3 SUPPORT FACILITIES INSTALLATION

- A. Project Identification and Temporary Signs: Prepare Project identification and other signs in sizes indicated or as directed. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs.
 - 1. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
 - 2. Prepare temporary signs to provide directional information to construction personnel and visitors.
- B. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Division 1 Section 01700 "Execution Requirements" for progress cleaning requirements.
 - 1. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
 - 2. Develop a waste management plan for Work performed on Project. Indicate types of waste materials Project will produce and estimate quantities of each type. Provide detailed information for on-site waste storage and separation of recyclable materials. Provide information on destination of each type of waste material and means to be used to dispose of all waste materials.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
- B. Stormwater Control: Provide earthen embankments and similar barriers in and around excavations and subgrade construction, sufficient to prevent flooding by runoff of stormwater from heavy rains. Provide stormwater control in accordance with Contractor's approved Stormwater Pollution Prevention Plan.
- C. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from construction damage. Protect tree root systems from damage, flooding, and erosion.
- D. Pest Control: Before deep foundation work has been completed, retain a local exterminator or pest-control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest-control service to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial

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Temporary Facilities and Controls

Completion. Obtain extended warranty for the State. Perform control operations lawfully, using environmentally safe materials.

- E. Site Enclosure Fence: Before construction operations begin install enclosure fence with lockable entrance gates. Locate where indicated, or enclose entire Project site or portion determined sufficient to accommodate construction operations. Install in a manner that will prevent people, dogs, and other animals from easily entering site except by entrance gates.
 - 1. Set portable chain-link fence posts in concrete or galvanized steel bases.
 - 2. Provide gates in sizes and at locations necessary to accommodate delivery vehicles and other construction operations.
 - 3. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide the State with one set of keys.
- F. 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 not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 - 2. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials.
 - 3. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
 - 4. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.
- G. Temporary Fire Protection: Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.
 - 1. Provide fire extinguishers visible and accessible from space being served.
 - a. Locate fire extinguishers where convenient and effective for their intended purpose.
 - 2. Store combustible materials in containers in fire-safe locations.
 - 3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, and other access routes for firefighting. Prohibit smoking in hazardous fire-exposure areas.
 - 4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.

5. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire agencies having jurisdiction and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
6. Provide hoses for fire protection of sufficient length to reach construction areas. 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.

3.5 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. Protect from damage caused by freezing temperatures and similar elements.
 1. Maintain operation of temporary enclosures, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.
- C. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, 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 the property of Contractor. The State reserves right to take possession of Project identification signs.
 2. At Substantial Completion, clean and renovate permanent facilities used during construction period.

END OF SECTION 01500

SECTION 01575
CONSTRUCTION WASTE MANAGEMENT

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 State's Representative where Construction Waste Management requirements could detrimentally impact construction schedule.
- B. Waste Management Objective for the Project:
 - 1. The State 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. Bricks
 - 7. Concrete Masonry Units (CMU)
 - 8. Asphalt Concrete
 - 9. Paper
 - a. Bond
 - b. Newsprint
 - c. Cardboard and paper packaging materials

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10. Cement Fiber Products: Shingles, panels, and siding
11. Metals
 - a. Ferrous
 - b. Non-Ferrous
12. Paint
13. Rigid Foam
14. Glass
15. Plastics
16. Carpet and pad
17. Beverage Containers
18. Insulation
19. Gypsum Board
20. Porcelain Plumbing Fixtures
21. Florescent Light Tubes (per Department of Toxic Substances Control regulations)

1.2 RELATED REQUIREMENTS

- A. Appendix 01575A: Construction Waste Estimate.
- B. Appendix 01575B: Waste Management Report.
- C. Section 01330: Submittal Procedures.
- D. Section 01770: 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.

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- 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 01575B, 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 01575B, Waste Management Report, or use them as a basis for Contractor's forms.
 5. The State will provide electronic copies of Appendix 01575B for Contractors' use.
- B. Submit Waste Management Report under provisions of Section 01770 – "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 State's Representative.
- 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.

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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 01575

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 01700 EXECUTION REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes general procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. General installation of products.
 - 4. Progress cleaning.
 - 5. Starting and adjusting.
 - 6. Protection of installed construction.
 - 7. Correction of the Work.

1.2 SUBMITTALS

- A. Certificates: Submit certificate signed by either a land surveyor or a professional engineer certifying that location and elevation of improvements comply with requirements.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.
- C. Certified Surveys: Submit two copies signed by the land surveyor or professional engineer.
- D. Record of Survey: Submit three copies showing the Work performed and record survey data.

1.3 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.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before

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beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.
- B. Existing Utilities: 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 and other construction affecting the Work.
1. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- C. Acceptance of Conditions: 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. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 2. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 3. 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 the State regarding existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by the 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 the State not less than two days in advance of proposed utility interruptions.
 2. Do not proceed with utility interruptions without the State's written permission.
- C. 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.

- D. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- E. 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 the State's Representative. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents, on a Request for Information form. (RFI)]

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify the State promptly.
- B. General: Engage a licensed land surveyor or professional engineer to lay out the Work using 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 dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 - 3. Inform installers of lines and levels to which they must comply.
 - 4. Check the location, level and plumb, of every major element as the Work progresses.
 - 5. Notify the State when deviations from required lines and levels exceed allowable tolerances.
 - 6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.
- D. 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.
- E. 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

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types of instruments and tapes used. Make the log available for reference by the State.

3.4 FIELD ENGINEERING

- A. 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.
- B. Benchmarks: Establish and maintain a minimum of two 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.
- C. 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.
- D. Record of Survey: Where a Record of Survey is specified, Prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by licensed land surveyor—or professional engineer licensed to practice surveying that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Recording: At Substantial Completion, have the final property survey recorded by or with authorities having jurisdiction as the official "property survey."

3.5 INSTALLATION

- A. General: 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 the best possible results. 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.
- E. Anchors and Fasteners: Provide anchors and fasteners as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the State.
 - 2. Allow for building movement, including thermal expansion and contraction.
- F. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- G. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Coordinate progress cleaning for joint-use areas where more than one installer has worked. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 2. Do not hold materials more than 7 days during normal weather or 3 days if the temperature is expected to rise above 90 deg F.
 - 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
- 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.

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- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Waste Disposal: Burying or burning waste materials on-site will not be permitted. Washing waste materials down sewers or into waterways will not be permitted.
- G. 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.
- H. 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.
- I. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.7 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust operating components for proper operation without binding. Adjust equipment for proper operation.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.8 PROTECTION 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. Comply with manufacturer's written instructions for temperature and relative humidity.

3.9 CORRECTION OF THE WORK

- A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

- 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.
- E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01700

SECTION 01731 CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.

1.2 SUBMITTALS

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least 10 days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
 - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
 - 2. Changes to Existing Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
 - 3. Products: List products to be used and firms or entities that will perform the Work.
 - 4. Dates: Indicate when cutting and patching will be performed.
 - 5. Utilities: List utilities that cutting and patching procedures will disturb or affect. List utilities that will be relocated and those that will be temporarily out of service. Indicate how long service will be disrupted.
 - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
 - 7. The State's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.3 QUALITY ASSURANCE

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. 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.
 - 1. Main water service feed.
- C. Miscellaneous Elements: Do not cut and patch the following elements or related components in a manner that could change their load-carrying capacity,

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that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety.

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

1.4 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections of these Specifications.
- B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
 - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Temporary Support: Provide temporary support of Work to be cut.

- B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 PERFORMANCE

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut existing 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 as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 - 2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 - 3. Concrete or 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 Division 2 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.
- C. 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 possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.

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Cutting and Patching

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate 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.

END OF SECTION 01731

SECTION 01732 SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes demolition and removal of the following:
 - 1. Selected portions of a building or structure.
 - 2. Selected site elements.
 - 3. Repair procedures for selective demolition operations.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to the State.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.3 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain the State's property, demolished materials shall become Contractor's property and shall be removed from Project site.

1.4 SUBMITTALS

- A. Schedule of Selective Demolition Activities: Indicate detailed sequence of selective demolition and removal work, with starting and ending dates for each activity, interruption of utility services, use of elevator and stairs, and locations of temporary partitions and means of egress.
- B. Predemolition Photographs or Videotape: Document existing conditions of adjoining construction and site improvements adjacent to demolition operations. Submit photographs and/or videotapes taken in the presence of the State's Representative. Submit before Work begins.
- C. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

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Selective Demolition

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Predemolition Conference: Conduct conference at Project site. Review predemolition condition documentation.

1.6 PROJECT CONDITIONS

- A. The State will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so the State's operations will not be disrupted. Provide not less than 72 hours' notice to the State of activities that will affect the State's operations.
- B. Maintain safe access to existing walkways, corridors, and other adjacent occupied or used facilities.
 - 1. Do not close or obstruct walkways or other occupied or used facilities without written permission from authorities having jurisdiction.
- C. The State assumes no responsibility for condition of areas to be selectively demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by the State as far as practical.
- D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.
 - 1. If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify the State Representative.
- E. Storage or sale of removed items or materials on-site will not be permitted.
- F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.7 WARRANTY

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS

- A. Use repair materials identical to existing materials.
 - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
 - 2. Use materials whose installed performance equals or surpasses that of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to the State.
- E. Engage a professional engineer to survey condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

3.2 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by the State and authorities having jurisdiction. Provide temporary services during interruptions to existing utilities, as acceptable to the State and to authorities having jurisdiction.

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Selective Demolition

1. Provide at least 48 hours' written notice to the State if shutdown of service is required during changeover.
- C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
1. Arrange to shut off indicated utilities with utility companies.
 2. If utility services are required to be removed, relocated, or abandoned, provide temporary utilities before proceeding with selective demolition that bypass area of selective demolition and that maintain continuity of service to other parts of building.
 3. Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
- D. Utility Requirements: Refer to Division 15 and 16 Sections for shutting off, disconnecting, removing, and sealing or capping utilities. Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.3 PREPARATION

- A. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from the State and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
 2. Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by the State.
 3. Protect existing site improvements, appurtenances, and landscaping to remain.

3.4 POLLUTION CONTROLS

- A. Dust Control: Use water mist, temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.5 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations.
 - 1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction.
 - 2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch portable fire-suppression devices during flame-cutting operations.
 - 4. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Removed and Salvaged Items:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area until delivery to the State.
 - 4. Transport items to the State's storage area on-site.
 - 5. Protect items from damage during transport and storage.
- C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by the State, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Patching: Comply with Division 1 Section 01731 "Cutting and Patching."
- C. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
 - 1. Completely fill holes and depressions in existing masonry walls that are to remain with an approved masonry patching material applied according to manufacturer's written recommendations.

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Selective Demolition

3.7 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off the State's property and legally dispose of them.

END OF SECTION 01732

SECTION 01770 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.

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Closeout Procedures

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.

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- 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

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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 01770

SECTION 02080
PIPED UTILITIES - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Transition fittings.
 - 3. Dielectric fittings.
 - 4. Sleeves.
 - 5. Identification devices.
 - 6. Grout.
 - 7. Piped utility demolition.
 - 8. Equipment installation requirements common to equipment sections.
 - 9. Concrete bases.
 - 10. Metal supports and anchorages.

1.2 DEFINITIONS

- A. Exposed Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions.
- B. Concealed Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 SUBMITTALS

- A. Welding certificates.

1.4 QUALITY ASSURANCE

- A. Steel Support Welding: Qualify processes and operators according to AWS D1.1, "Structural Welding Code--Steel."
- B. Steel Pipe Welding: Qualify processes and operators according to ASME Boiler and Pressure Vessel Code: Section IX, "Welding and Brazing Qualifications."
 - 1. Comply with provisions in ASME B31 Series, "Code for Pressure Piping."
 - 2. Certify that each welder has passed AWS qualification tests for welding processes involved and that certification is current.
- C. Comply with ASME A13.1 for lettering size, length of color field, colors, and viewing angles of identification devices.

PART 2 - PRODUCTS

2.1 JOINING MATERIALS

- A. Refer to individual Division 2 piping Sections for special joining materials not listed below.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.
- C. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.
 - 1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
 - a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.
 - b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.
 - 2. AWWA C110, rubber, flat face, 1/8 inch thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.
- D. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.
- E. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- F. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- G. Brazing Filler Metals: AWS A5.8, BCuP Series, or BAg1, unless otherwise indicated.
- H. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- I. Solvent Cements for Joining Plastic Piping:
 - 1. ABS Piping: ASTM D 2235.
 - 2. CPVC Piping: ASTM F 493.
 - 3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - 4. PVC to ABS Piping Transition: ASTM D 3138.
- J. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with, piping to be joined.

2.2 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
- D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150-psig minimum working pressure as required to suit system pressures.
- E. Dielectric-Flange Kits: Companion-flange assembly for field assembly. Include flanges, full-face- or ring-type neoprene or phenolic gasket, phenolic or polyethylene bolt sleeves, phenolic washers, and steel backing washers.
 - 1. Separate companion flanges and steel bolts and nuts shall have 150-psig minimum working pressure where required to suit system pressures.
- F. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.
- G. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

2.3 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- D. Molded PE: Reusable, PE, tapered-cup shaped and smooth-outer surface with nailing flange for attaching to wooden forms.

2.4 IDENTIFICATION DEVICES

- A. Equipment Nameplates: Metal permanently fastened to equipment with data engraved or stamped.

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1. Data: Manufacturer, product name, model number, serial number, capacity, operating and power characteristics, labels of tested compliances, and essential data.
 2. Location: Accessible and visible.
- B. Plastic Tape: Manufacturer's standard color-coded, pressure-sensitive, self-adhesive vinyl tape, at least 3 mils thick.
1. Width: 1-1/2 inches on pipes with OD, including insulation, less than 6 inches; 2-1/2 inches for larger pipes.
 2. Color: Comply with ASME A13.1, unless otherwise indicated.
- C. Valve Tags: Stamped or engraved with 1/4-inch letters for piping system abbreviation and 1/2-inch sequenced numbers. Include 5/32-inch hole for fastener.
1. Material: 0.032-inch thick, polished brass.
 2. Valve Tag Fasteners: Brass, wire-link or beaded chain; or brass S-hooks.
- D. Engraved Plastic-Laminate Signs: ASTM D 709, Type I, cellulose, paper-base, phenolic-resin-laminate engraving stock; Grade ES-2, black surface, black phenolic core, with white melamine subcore, unless otherwise indicated. Fabricate in sizes required for message. Provide holes for mechanical fastening.
1. Engraving: Engraver's standard letter style, of sizes and with terms to match equipment identification.
 2. Thickness: 1/16 inch, for units up to 20 sq. in. or 8 inches in length, and 1/8 inch for larger units.
 3. Fasteners: Self-tapping, stainless-steel screws or contact-type permanent adhesive.

2.5 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.
1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
 2. Design Mix: 5000-psi, 28-day compressive strength.
 3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 PIPED UTILITY DEMOLITION

- A. Disconnect, demolish, and remove piped utility systems, equipment, and components indicated to be removed.
 - 1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - 2. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material.
- B. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 2 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping to permit valve servicing.
- E. Install piping at indicated slopes.
- F. Install piping free of sags and bends.
- G. Install fittings for changes in direction and branch connections.
- H. Select system components with pressure rating equal to or greater than system operating pressure.
- I. Verify final equipment locations for roughing-in.
- J. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

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3.3 PIPING JOINT CONSTRUCTION

- A. Join pipe and fittings according to the following requirements and Division 2 Sections specifying piping systems.
- B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
- D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
- E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Welded Joints: Construct joints according to AWS D10.12, using qualified processes and welding operators according to Part 1 "Quality Assurance" Article.
- H. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- I. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 - 3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.

4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 5. PVC Nonpressure Piping: Join according to ASTM D 2855.
 6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.
- J. Plastic Pressure Piping Gasketed Joints: Join according to ASTM D 3139.
- K. Plastic Nonpressure Piping Gasketed Joints: Join according to ASTM D 3212.
- L. PE Piping Heat-Fusion Joints: Clean and dry joining surfaces by wiping with clean cloth or paper towels. Join according to ASTM D 2657.
1. Plain-End Pipe and Fittings: Use butt fusion.
 2. Plain-End Pipe and Socket Fittings: Use socket fusion.
- M. Fiberglass Bonded Joints: Prepare pipe ends and fittings, apply adhesive, and join according to pipe manufacturer's written instructions.

3.4 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
 3. Dry Piping Systems: Install dielectric unions and flanges to connect piping materials of dissimilar metals.
 4. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment level and plumb, unless otherwise indicated.
- B. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference with other installations. Extend grease fittings to an accessible location.
- C. Install equipment to allow right of way to piping systems installed at required slope.

3.6 IDENTIFICATION

- A. Piping Systems: Install pipe markers on each system. Include arrows showing normal direction of flow.
 - 1. Plastic markers, with application systems. Install on insulation segment if required for hot noninsulated piping.
 - 2. Locate pipe markers on exposed piping according to the following:
 - a. Near each valve and control device.
 - b. Near each branch, excluding short takeoffs for equipment and terminal units. Mark each pipe at branch if flow pattern is not obvious.
 - c. At manholes and similar access points that permit view of concealed piping.
 - d. Near major equipment items and other points of origination and termination.
- B. Equipment: Install engraved plastic-laminate sign or equipment marker on or near each major item of equipment.
 - 1. Lettering Size: Minimum 1/4 inch high for name of unit if viewing distance is less than 24 inches, 1/2 inch high for distances up to 72 inches, and proportionately larger lettering for greater distances. Provide secondary lettering two-thirds to three-fourths of size of principal lettering.
 - 2. Text of Signs: Provide name of identified unit. Include text to distinguish among multiple units, inform user of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
- C. Adjusting: Relocate identifying devices that become visually blocked by work of this or other Divisions.

3.7 CONCRETE BASES

- A. Concrete Bases: Anchor equipment to concrete base according to equipment manufacturer's written instructions and according to seismic codes at Project.
 - 1. Construct concrete bases of dimensions indicated, but not less than 4 inches larger in both directions than supported unit.
 - 2. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of the base.
 - 3. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.
 - 4. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

5. Install anchor bolts to elevations required for proper attachment to supported equipment.
6. Install anchor bolts according to anchor-bolt manufacturer's written instructions.
7. Use 3000-psi, 28-day compressive-strength concrete and reinforcement as specified in Division 2 Section 02751 "Cement Concrete Pavement."

3.8 ERECTION OF METAL SUPPORTS AND ANCHORAGES

- A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor piped utility materials and equipment.
- B. Field Welding: Comply with AWS D1.1.

3.9 GROUTING

- A. Mix and install grout for equipment base bearing surfaces, pump and other equipment base plates, and anchors.
- B. Clean surfaces that will come into contact with grout.
- C. Provide forms as required for placement of grout.
- D. Avoid air entrapment during placement of grout.
- E. Place grout, completely filling equipment bases.
- F. Place grout on concrete bases and provide smooth bearing surface for equipment.
- G. Place grout around anchors.
- H. Cure placed grout.

END OF SECTION 02080

SECTION 02221 BUILDING DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes demolition and removal of the following:
 - 1. Buildings and structures.
 - 2. Site improvements.

1.2 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or recycled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to State's Representative.
- C. Existing to Remain: Existing items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or recycled.

1.3 MATERIALS OWNERSHIP

- A. Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques, and other items of interest or value to the State that may be encountered during building demolition remain the State's property. Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to State's Representative.

1.4 SUBMITTALS

- A. Qualification Data: For the following:
 - 1. Demolition firm.
- B. Proposed Protection and Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Identify options if proposed measures are later determined to be inadequate. Include measures for the following:
 - 1. Environmental protection.
 - 2. Dust control.
 - 3. Noise control.

Building Demolition

- C. Schedule of Building Demolition Activities: Indicate detailed sequence of demolition and removal work, with starting and ending dates for each activity, interruption of utility services, and locations of temporary protection and means of egress.
- D. Predemolition photographs: Show existing conditions of adjoining construction and site improvements that might be misconstrued as damage caused by building demolition operations. Submit before Work begins.
- E. Landfill Records: Indicate receipt and acceptance of hazardous wastes by a landfill facility licensed to accept hazardous wastes.

1.5 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- C. Standards: Comply with ANSI A10.6 and NFPA 241.
- D. Predemolition Conference: Conduct conference at Project site with State's Representative prior to proceeding with demolition work.

1.6 PROJECT CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of Work.
- B. Conduct building demolition so park operations will not be disrupted.
 - 1. Provide not less than 72 hours notice to State's Representative of activities that will affect Park operations.
 - 2. Maintain access to existing walkways, exits, and other adjacent occupied or used facilities.
 - a. Do not close or obstruct walkways, exits, or other occupied or used facilities without written permission from the State's Representative..
- C. The State assumes no responsibility for buildings and structures to be demolished.
 - 1. Conditions existing at time of inspection for bidding purpose will be maintained by the State as far as practical.

- D. Hazardous Materials: Hazardous materials are present in buildings and structures to be demolished. A report on the presence of hazardous materials is included in the Appendix of the Contract Documents for review and use. Examine report to become aware of locations where hazardous materials are present.
 - 1. Hazardous material remediation is specified in Division 2, Section 02100 "Hazardous Materials" in the Contract Documents.
 - 2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified in Section 02100 of the Contract Documents.
- E. Storage or sale of removed items or materials on-site is not permitted.

1.7 COORDINATION

- A. Arrange demolition schedule so as not to interfere with the Park's on-site operations.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Division 2 Section 02300 "Earthwork" when applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Survey existing conditions and correlate with requirements indicated to determine extent of building demolition required.
- B. Review Construction Documents of existing construction provided on drawings. State does not guarantee that existing conditions are same as those indicated in Contract Documents.
- C. Inventory and record the condition of items to be removed and salvaged.
- D. When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to State's Representative.
- E. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.

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Building Demolition

- F. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

3.2 PREPARATION

- A. Existing Utilities: Locate, identify, disconnect, and seal or cap off indicated utilities serving buildings and structures to be demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If utility services are required to be removed, relocated, or abandoned, before proceeding with building demolition provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 3. Cut off pipe or conduit a minimum of 24 inches below grade. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
- C. Removed and Salvaged Items: Comply with the following:
 - 1. Clean salvaged items of dirt and demolition debris.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in secure area until delivery to the State.
 - 4. Transport items to State's designated storage area.
 - 5. Protect items from damage during transport and storage.

3.3 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, pavement, park furniture, and natural vegetation and landscaping to remain during demolition operations.
- B. Existing Utilities: Maintain utility services indicated to remain and protect them against damage during demolition operations.
 - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by the State and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to the State and to authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to the State if shutdown of service is required during changeover.

3.4 DEMOLITION, GENERAL

- A. General: Demolish as indicated on plans, existing buildings, structures, and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain adequate ventilation when using cutting torches.
 - 3. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- B. Engineering Surveys: Perform surveys as the Work progresses to detect hazards that may result from building demolition activities.
- C. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from the State and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.
 - 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.

3.5 MECHANICAL DEMOLITION

- A. Remove buildings, structures, and site improvements intact when permitted by authorities having jurisdiction.
- B. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on next lower level.
- C. Remove debris from elevated portions by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact or dust generation.
- D. Concrete: Cut concrete full depth at junctures with construction indicated to remain, using power-driven saw, then remove concrete between saw cuts.
- E. Masonry: Cut masonry at junctures with construction indicated to remain, using power-driven saw, then remove masonry between saw cuts.

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Building Demolition

- F. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished at junctures with construction indicated to remain, then break up and remove.
- G. Building Components: Remove the following components, as whole units, intact and undamaged and deliver to the District:
 - 1. Doors.
 - 2. Windows.
 - 3. Door hardware.
 - 4. Cabinets.
 - 5. Mirrors.
 - 6. Toilet accessories.
 - 7. Plumbing fixtures.
 - 8. Light fixtures.
- H. Equipment: Disconnect equipment at nearest fitting connection to services, complete with service valves. Remove as whole units, complete with controls.
- I. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
 - 1. Remove below-grade construction, including foundation walls, and footings, completely.
- J. Existing Utilities: Demolish existing utilities and below-grade utility structures that are within 5 feet outside of footprint indicated for new construction. Abandon utilities outside this area.

3.6 EXPLOSIVE DEMOLITION

- A. Explosives: Use of explosives is not permitted.

3.7 SITE RESTORATION

- A. Below-Grade Areas: Rough grade below-grade areas ready for further excavation or new construction.
- B. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials according to backfill requirements in Division 2 Section 02300 "Earthwork."
- C. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.

3.8 REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by building demolition operations.
- B. Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
- C. Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.9 RECYCLING DEMOLISHED MATERIALS

- A. General: Separate recyclable demolished materials from other demolished materials to the maximum extent possible. Separate recyclable materials by type.
 - 1. Provide containers or other storage method approved by the State's Representative for controlling recyclable materials until they are removed from Project site.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from demolition area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Transport recyclable materials off State property and legally dispose of them.
- B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling building demolition materials shall accrue to Contractor.

3.10 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain State's property, remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill.
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off the State's property and legally dispose of them.

3.11 CLEANING

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Building Demolition

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.

END OF SECTION 02221

SECTION 02230 SITE CLEARING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Protecting existing trees and vegetation to remain.
 - 2. Removing above-grade site improvements.
 - 3. Disconnecting, capping or sealing, and abandoning site utilities in place.
 - 4. Disconnecting, capping or sealing, and removing site utilities.

1.2 MATERIALS OWNERSHIP

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

1.3 PROJECT CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations.
- B. Salvable Improvements: Carefully remove items indicated to be salvaged and store at location indicated by the State's Representative..
- C. Notify utility locator service for area where Project is located before site clearing.

1.4 RELATED REQUIREMENTS

- A. Section 02235 – Water Pollution Control
- B. Section 00810 – Constraints & Mitigation.
- C. Section 02231 – Tree Protection.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory Soil Materials: As specified in Division 2 Section 02300 "Earthwork."
 - 1. Obtain approved borrow soil materials off-site when satisfactory soil materials are not available on-site.

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Site Clearing

PART 3 - EXECUTION

3.1 PREPARATION

- A. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- B. Locate and clearly flag trees and vegetation to remain or to be relocated.
- C. Protect existing site improvements to remain from damage during construction.
 - 1. Restore damaged improvements to their original condition, as acceptable to State Parks.

3.2 TREE PROTECTION

- A. Refer to Division 2; section 02231 "Tree Protection".

3.3 UTILITIES

- A. Locate, identify, disconnect, and seal or cap off utilities indicated to be removed.
- B. Do not interrupt utilities serving facilities occupied by the State or others unless permitted. Arrange to provide temporary utility services.
- C. Excavate for and remove underground utilities indicated to be removed.

3.4 SITE IMPROVEMENTS

- A. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.

3.5 DISPOSAL

- A. Disposal: 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.

END OF SECTION 02230

SECTION 02231 TREE PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the protection of existing trees in the project area.

1.2 REQUIREMENTS

- A. Arborist Qualifications: An arborist certified by the International Society of Arboriculture or licensed in jurisdiction where the Project is located.
- B. Tree Pruning Standards: Comply with ANSI A300, "Trees, Shrubs, and Other Woody Plant Maintenance - Standard Practices."

1.3 DEFINITIONS

- A. DBH – Diameter at Breast Height of tree, or 54-inches from ground level, measured on the high side of the tree.
- B. TPZ - Tree Protection Zone, a distance of 5 times the DBH from the tree trunk, or at the tree drip line, whichever is greater.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Construction Fence: Fencing around trees and planted areas to be protected from construction damage shall consist of 36-inches minimum height plastic orange color temporary construction fencing as manufactured by White Cap or approved equal. Posts may be steel driven type, or self-supporting type, as per plans or directions of the State's Representative.

PART 3 - EXECUTION

3.1 PREPARATION

- A. The Contractor shall meet on site with the State's Representative to review all required protection measures.

Tree Protection

- B. The Contractor shall locate and clearly flag trees to be protected, as shown on the construction documents or as directed by the State's Representative.
- C. The Contractor and State's Representative shall review all protected trees whose root zones may be impacted by the new construction. When working within the TPZ is unavoidable and approved by the State's Representative, tree trunk protection shall be installed. The Contractor shall install the tree trunk protection measures as outlined in Part 3 of this Section.
- D. The State's Representative shall designate trees to be protected during the project pre-construction meeting, including those that may not have been designated on the project construction plans. Designated protection assignment is not limited to only the project construction meeting. The Contractor shall utilize protection measures as outlined in Part 3 of this Section.
- E. The Contractor is prohibited from storing or stockpiling material, parking and vehicular traffic, as determined by the State's Representative, within the TPZ of trees.
- F. The Contractor shall avoid flooding, eroding or excessive moisture within the TPZ.

3.2 TREE PROTECTION

- A. The 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.
- B. All trees that have approved construction activities occurring within the TPZ of the tree trunk shall be protected using this tree trunk protection measure. Tree trunk and root protection shall consist of a wood guard that is constructed from 2"x 6"x 8' pieces of lumber that are placed at 12-inch on center and then attached vertically around the entire trunk of the tree using 3-inch wide nylon straps. Lumber shall extend to the natural base of the tree and must protect any exposed roots.
- C. No fill shall be placed against the trunks of protected trees.
- D. No fill shall be placed within the TPZ, unless approved by the State's Representative.
- E. Where excavation for new construction is approved within the TPZ, the Contractor shall locate the root zone and do one or more of the following:
 - 1. Hand clear to prevent root damage, in a manner approved by the State's Representative.
 - 2. Tunnel below the roots.

3. Directional drill beneath the roots.

3.3 TREE PRUNING

- A. No pruning shall be conducted unless approved by the State's Representative and as directed by a certified arborist.

3.4 TREE REPAIR

- A. In the event that a tree is damaged during construction operations, the damaged limb, trunk or root shall be treated within 24 hours in a manner approved by the State Representative's and as directed by a certified arborist.

3.5 DISPOSAL

- A. The Contractor shall remove excess excavated material, displaced trees, and excess chips from State Park's property. Burning shall not be permitted.

3.6 TREE DAMAGE PENALTY

- A. 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 at 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. $\text{Total Tree Value} = \$2.16 \times (\text{Trunk circumference in inches at DBH})^2$.

- b. Example: 24-inch Diameter Pine

Circumference = 75.4 inches

$\$2.16 \times (75.4)^2 = \$12,280$

Total Tree Value \$12,280

2. A proportional amount of the 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 trunk and root damage shall not exceed a factor of 1.0.

- a. $\text{Damage} = \text{Total Tree Value} \times (\text{Trunk Damage Factor} + \text{Root Damage Factor})$

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Tree Protection

- b. Trunk Damage = Maximum width of trunk damage divided by trunk circumference.
- c. 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.

Trunk damage: $6 \div 75.4 = 0.08$

Root damage: $0.1 + 0.2 = 0.3$

Damage \$ = $\$12,280 \times (0.08 + 0.3)$

Total Damage \$4,666

- 3. 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.

END OF SECTION 02231

SECTION 02235 WATER POLLUTION CONTROL

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section describes the following Work:
 - 1. Implementation of sediment control, erosion control, and spill prevention measures during construction period and upon close-out of Project.
 - 2. Maintenance and repair of sediment control, erosion control, and spill prevention measures during the construction period.
- B. Related Sections:
 - 1. Section 00810: Constraints and Mitigations
 - 2. Section 02230: Site Clearing
 - 3. Section 02300: Earthwork
- C. Definitions:
 - 1. Construction Period: Between the dates of Notice to Proceed and Substantial Completion of the Work.
 - 2. Maintenance Period: Between the date of Notice to Proceed and completion of Work or the end of the rainy season.

PART 2 - PRODUCTS

2.1 MATERIALS AND PROCEDURES

- A. All materials and procedures required to execute the installation and maintenance of Best Management Practices (BMPs) for erosion and sediment control, and for spill prevention, containment, and cleanup of any non-sediment pollutants shall meet the minimum criteria defined in the *California Stormwater Best Management Practices Handbook*, 2004 (Handbook). This handbook is available at the following website:

www.cabmphandbooks.com/construction.asp

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. At a minimum the Contractor shall install and maintain temporary erosion and sediment control measures (BMPs) for erosion and sediment control, and for spill prevention, containment, and cleanup for any non-sediment pollutants that shall meet the minimum criteria in the *California Stormwater Best Management Practices Handbook*, 2004 (the handbook). These measures shall be implemented and maintained throughout the Construction Period and upon close-out of construction contract.
- B. During the Construction Period, the Contractor shall maintain on-site sufficient quantities of erosion and sediment control materials to be installed in the event that rain is forecast, and for rapid response to failures or emergencies. The Contractor shall consult the local weather forecast daily.
- C. If rain is forecast, the Contractor shall, at a minimum, secure all soil stockpiles by covering and installing a silt barrier around the perimeter of stockpiles.

3.2 CLEANUP

- A. Upon completion of the Construction Period, unless otherwise directed by the State Representative, remove all unused erosion control materials, and remove all used erosion control measures that are no longer needed and dispose of properly off State property. Some BMPs may need to remain in place after construction as part of permanent BMPs or to continue to control potential pollution through the rainy season. Regrade drainage ditches and over-silted areas to even and smooth grade. Leave site in clean condition, acceptable to the State Representative.

END OF SECTION 02235

SECTION 02260
EXCAVATION SUPPORT AND PROTECTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes temporary excavation support and protection systems.

1.2 PERFORMANCE REQUIREMENTS

- A. Design, furnish, install, monitor, and maintain excavation support and protection system capable of supporting excavation sidewalls and of resisting soil and hydrostatic pressure and superimposed and construction loads.
 - 1. Provide professional engineering services needed to assume engineering responsibility, including preparation of Shop Drawings and a comprehensive engineering analysis by a qualified professional engineer.

1.3 SUBMITTALS

- A. Shop Drawings for Information: Prepared by or under the supervision of a qualified professional engineer for excavation support and protection systems.
 - 1. Include Shop Drawings signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 PROJECT CONDITIONS

- A. Survey adjacent structures and improvements, employing a qualified professional engineer or land surveyor; establish exact elevations at fixed points to act as benchmarks. Clearly identify benchmarks and record existing elevations.
 - 1. During installation of excavation support and protection systems, regularly resurvey benchmarks, maintaining an accurate log of surveyed elevations and positions for comparison with original elevations and positions. Promptly notify Architect if changes in elevations or positions occur or if cracks, sags, or other damage is evident in adjacent construction.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Provide materials that are either new or in serviceable condition.
- B. Structural Steel: ASTM A 36/A 36M, ASTM A 690/A 690M, or ASTM A 992/A 992M.

Excavation Support and Protection

- C. Steel Sheet Piling: ASTM A 328/A 328M, ASTM A 572/A 572M, or ASTM A 690/A 690M; with continuous interlocks.
- D. Wood Lagging: Lumber, mixed hardwood, nominal rough thickness of 3 inches.
- E. Cast-in-Place Concrete: ACI 301, of compressive strength required for application.
- F. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

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 that could develop during excavation support and protection system operations.
- B. Install excavation support and protection systems to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.
- C. Monitor excavation support and protection systems daily during excavation progress and for as long as excavation remains open. Promptly correct bulges, breakage, or other evidence of movement to ensure that excavation support and protection systems remain stable.
- D. Promptly repair damages to adjacent facilities caused by installing excavation support and protection systems.

3.2 REMOVAL AND REPAIRS

- A. Remove excavation support and protection systems when construction has progressed sufficiently to support excavation and bear soil and hydrostatic pressures. Remove in stages to avoid disturbing underlying soils or damaging structures, pavements, facilities, and utilities.
 - 1. Remove excavation support and protection systems to a minimum depth of 48 inches below overlying construction and abandon remainder.
 - 2. Repair or replace, as approved by Architect, adjacent work damaged or displaced by removing excavation support and protection systems.
- B. Leave excavation support and protection systems permanently in place.

END OF SECTION 02260

SECTION 02300 EARTHWORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Preparing subgrades.
 - 2. Excavating and backfilling.
 - 3. Subbase course for concrete walks and pavements.
 - 4. Base course for asphalt paving.

1.2 DEFINITIONS

- A. Backfill: Soil materials used to fill an excavation.
- B. Base Course: Layer placed between the subbase course and asphalt paving.
- C. Bedding Course: Layer placed over the excavated subgrade in a trench before laying pipe.
- D. Borrow: Satisfactory soil imported from off-site for use as fill or backfill.
- E. Excavation: Removal of material encountered above subgrade elevations.
 - 1. Additional Excavation: Excavation below subgrade elevations as directed by State's Representative. 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 dimensions without direction by the State's Representative. Unauthorized excavation, as well as remedial work directed by the State's Representative, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Native Soil: Soil excavated on site, which can be used as fill or backfill, if specified in plans and specifications.
- H. Select Fill: Native soil that has been screened to remove rocks and deleterious organic material, which may be used for fill or backfill if specified in plans or specifications.

Earthwork

- I. 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.
- J. Subbase Course: Layer placed between the subgrade and base course for asphalt paving, or layer placed between the subgrade and a concrete pavement or walk.
- K. Subgrade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below subbase, drainage fill, or topsoil materials.
- L. Utilities include on-site underground pipes, conduits, ducts, and cables, as well as underground services within buildings.

1.3 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the State or others unless permitted in writing by the State's Representative and then only after arranging to provide temporary utility services according to requirements indicated.

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: ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM, or a combination of these group symbols; free of rock or gravel larger than 1-1/2 inches in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
- C. Unsatisfactory Soils: ASTM D 2487 Soil Classification Groups GC, SC, ML, MH, CL, CH, OL, OH, and PT, or a combination of these group symbols.
- D. Backfill and Fill: Satisfactory soil materials.
- E. Subbase: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch sieve and not more than 12 percent passing a No. 200 sieve.
- F. Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; meeting the requirements of Class 2, 3/4" maximum size, in conformance with Section 26 of the Standard

Specifications of California, Department of Transportation. Provide load tickets to the State's Representative at the time of delivery.

- G. Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.
- H. Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch sieve and 0 to 5 percent passing a No. 8 sieve.
- I. Detectable Warning Tape: Polyethylene film warning tape encasing a metallic core, minimum 6 inches wide and 4 mils thick, continuously inscribed with a description of the utility.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.
- B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- C. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- D. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
- E. Prior to excavation or trenching, existing surface shall be removed to saw cut lines. Saw cut shall be a neat, straight line one inch minimum depth.

3.2 EXCAVATION

- A. Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.
 - 1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

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- B. Excavate for structures, pavements, and walks to indicated elevations and dimensions. Extend excavations for placing and removing concrete formwork, for installing services and other construction, and for inspections. Trim bottoms to required lines and grades to leave solid base to receive other work.
- C. Excavate utility trenches to indicated gradients, lines, depths, and invert elevations of uniform widths to provide a working 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.
 - 1. Excavate trenches deeper than bottom of pipe elevation, 6 inches deeper in rock, 4 inches deeper elsewhere, to allow for bedding course.
- D. Proof roll subgrades, before filling or placing aggregate courses, with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated subgrades.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.
- F. 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 may be used when approved by State's Representative.
 - 1. Fill unauthorized excavations under other construction or utility pipe as directed by State's Representative.
- G. Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees.

3.3 BACKFILLS AND FILLS

- A. Utility Trench Backfill: Place, compact, and shape bedding course to provide continuous support for pipes and conduits over rock and other unyielding bearing surfaces and to fill unauthorized excavations.
 - 1. Place and compact initial backfill of satisfactory soil material or subbase material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit. Place and compact final backfill of satisfactory soil material to final subgrade.
 - 2. Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.
- B. Fill: Place and compact fill material in layers to required elevations.

- C. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content.
 - 1. 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.
- D. Compaction: Place backfill and fill 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.
- E. Compact soil to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill material at 95 percent.
 - 2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 92 percent.
 - 3. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill material at 85 percent.
- F. Grading: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpaved subgrades to tolerances of plus or minus 1 inch and pavements and areas within building lines to plus or minus 1/2 inch.
- G. Subbase and Base Courses: Under pavements and walks, place subbase course on prepared subgrade. Place base course material over subbase. Compact to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 1557.

3.4 FIELD QUALITY CONTROL

- A. Testing Agency: Contractor will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.
- B. Allow testing agency to test and inspect subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.
- C. 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 to depth required; recompact and retest until specified compaction is obtained.

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3.5 PROTECTION AND DISPOSAL

- A. 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.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
- D. Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off State Park property.

END OF SECTION 02300

SECTION 02510 WATER DISTRIBUTION

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes water-distribution piping and specialties outside the building for the following:

- 1. Water services.

1.2 SUBMITTALS

- A. Product Data: For the following:

- 1. Valves and accessories.

- B. Field quality-control test reports.

- C. Operation and Maintenance Data: For the following:

- 1. Valves.
 - 2. Protective enclosures.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements:

- 1. Comply with requirements of the safe drinking water standards of Sacramento County.
 - 2. Comply with standards of authorities having jurisdiction for potable-water-service piping, including materials, installation, testing, and disinfection.

- B. Piping materials shall bear label, stamp, or other markings of specified testing agency.

- C. Comply with the current approved edition of the California Plumbing Code.

- D. NSF Compliance:

- 1. Comply with NSF 14 for plastic potable-water-service piping.
 - 2. Comply with NSF 61 for materials for water-service piping and specialties for domestic water.

1.4 PROJECT CONDITIONS

- A. Existing Utilities: Do not interrupt utilities serving facilities occupied by the State or others unless permitted under the following conditions and then only after

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arranging to provide temporary utility services according to requirements indicated:

1. Notify 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 written permission.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
 2. 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.

2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Article for applications of pipe, tube, fitting, and joining materials.

2.3 PIPE AND FITTINGS

- A. Mechanical-Joint, Ductile-Iron Pipe: AWWA C151 with mechanical-joint, bell-and plain-spigot end unless grooved or flanged ends are indicated.
 1. Mechanical-Joint, Ductile-Iron Fittings: AWWA C110, ductile-or gray-iron standard pattern or AWWA C153, ductile-iron compact pattern.
 - a. Glands, Gaskets, and Bolts: AWWA C111, ductile- or gray-iron glands, rubber gaskets, and steel bolts.
- B. PVC, Schedule 40 Pipe: ASTM D 1785
 1. PVC, Schedule 40 Socket Fittings: ASTM D 2466.
- C. PVC, Schedule 80 Pipe: ASTM D 1785.
 1. PVC, Schedule 80 Socket Fittings: ASTM D 2467.
- D. PVC, AWWA Pipe: AWWA C900, Class 150, with bell end with gasket and spigot end.

1. PVC Fabricated Fittings: AWWA C900, Class 150, with bell-and-spigot or double-bell ends. Include elastomeric gasket in each bell.
 2. PVC Molded Fittings: AWWA C907, Class 150, with bell-and spigot or double-bell ends. Include elastomeric gasket in each bell.
- E. Polyvinyl Chloride Pipe: Polyvinyl Chloride (PVC) pipe shall bear the National Sanitation Foundation (NSF) seal of approval and conform to the following:

2.4 JOINING MATERIALS

- A. PVC Solvent: use the following:
1. Primer: ASTM F-656, NSF and IAPMO (CPC) listed, purple surface cleaner and primer.
 2. Cement: ASTM D-2564, NSF and IAPMO (CPC) listed, for joining pipe up to 4 inches in diameter.
- B. Brazing Filler Metals: AWS A5.8, BCuP Series.
- C. Soldering Flux: ASTM B 813, water-flushable type.
- D. Solder Filler Metal: ASTM B 32, lead-free type with 0.20 percent maximum lead content.

2.5 VALVES

- A. Gate Valves:
1. Available Manufacturers:
 - a. American AVK Co.; Valves & Fittings Div.
 - b. American Cast Iron Pipe Co.; American Flow Control Div.
 - c. Crane Co.; Crane Valve Group; Stockham Div.
 - d. Grinnell Corporation; Mueller Co.; Water Products Div.
 - e. McWane, Inc.; Tyler Pipe; Utilities Div.
 - f. NIBCO INC.
 - g. United States Pipe and Foundry Company.
 - h. or approved equal.
 2. Nonrising-Stem, Metal-Seated Gate Valves: bronze double-disc gate, bronze gate rings, bronze stem, and stem nut.
 - a. Minimum Working Pressure: 200 psig.
 - b. End Connections: Mechanical joint.
 - c. Interior Coating: Complying with AWWA C550.
- B. Ball Valves:

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1. Available Manufacturers:
 - a. American Cast Iron Pipe Co.; American Flow Control Div.
 - b. Crane Co.; Crane Valve Group; Stockham Div.
 - c. Grinnell Corporation; Mueller Co.; Water Products Div.
 - d. McWane, Inc.; M & H Valve Company Div.
 - e. NIBCO INC.
 - f. United States Pipe and Foundry Company.
 - g. or approved equal.
2. Ball Valves: Two piece bronze body and chrome plated or brass ball with full size port.
 - a. Minimum Working Pressure: 400 psig.
 - b. End Connections: match existing connection.

2.6 VALVE ACCESSORIES AND SPECIALTIES

- A. Valve Boxes: House buried valves in pre-cast concrete utility box with cast iron or galvanized steel traffic rated cover marked "WATER". Approximate size 12 inches by 20 inches.
 1. Operating Wrenches: Steel tee-handle with one pointed end, stem of length to operate deepest buried valve, and socket matching valve operating nut.
- B. Vertical-Type Indicator Posts: UL 789, FM-approved, cast-iron body with operating wrench, extension rod, and adjustable cast-iron barrel of length required for depth of burial of valve.

2.7 CURB VALVES

- A. Available Manufacturers:
 1. Amcast Industrial Corporation; Lee Brass Co.
 2. Ford Meter Box Company, Inc. (The).
 3. Grinnell Corporation; Mueller Co.; Water Products Div.
 4. Jones, James Company.
 5. Master Meter, Inc.
 6. Red Hed Manufacturing Co.
 7. or approved equal.
- B. Curb Valves: Comply with AWWA C800. Include bronze body, ground-key plug or ball, and wide tee head, with inlet and outlet matching service piping material.
- C. Service Boxes for Curb Valves: Similar to AWWA M44 requirements for cast-iron valve boxes. Include cast-iron telescoping top section of length required for

depth of burial of valve, plug with lettering "WATER," bottom section with base of size to fit over curb valve, and approximately 3-inch diameter barrel.

1. Shutoff Rods: Steel, tee-handle with one pointed end, stem of length to operate deepest buried valve, and slotted end matching curb valve.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Refer to Division 2 Section 02300 "Earthwork" for excavating, trenching, and backfilling.
- B. Underground Water-Service Piping: Use the following piping materials for each size range
 1. NPS 3/4 to NPS 2: Copper tube, Type K; wrought-copper fittings; and soldered joints.
 2. NPS 3/4 to NPS 2: PE, ASTM pipe; insert fittings for PE pipe and joints.
 3. NPS 3/4 to NPS 2: PVC, Schedule 80 pipe; PVC, Schedule 80 socket fittings; and solvent-cemented joints.
 4. NPS 4: Ductile-iron, mechanical-joint pipe; ductile-iron, mechanical-joint fittings; and mechanical joints.

3.2 VALVE APPLICATIONS

- A. General Application: Use mechanical-joint-end-valves for NPS 3 (DN 80) and larger underground installation. Use flanged-end valves for installation in vaults.
- B. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 1. Underground Valves, NPS 3 (DN 80) and Larger: AWWA, cast-iron, nonrising-stem, resilient-seated, gate valves with valve box.

3.3 JOINT CONSTRUCTION

- A. Make pipe joints according to the following:
 1. PVC Piping Gasketed Joints: Use joining materials according to AWWA C900. Construct joints with elastomeric seals and lubricant according to ASTM D 2774 or ASTM D 3139 and pipe manufacturer's written instructions.
 2. Dissimilar Materials Piping Joints: Use adapters compatible with both piping materials, with OD, and with system working pressure.

3.4 PIPING INSTALLATION

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- A. Make connections larger than NPS 2 with tapping machine according to the following:
 - 1. Install tapping sleeve and tapping valve according to MSS SP-60.
 - 2. Install tapping sleeve on pipe to be tapped. Position flanged outlet for gate valve.
 - 3. Use tapping machine compatible with valve and tapping sleeve; cut hole in main. Remove tapping machine and connect water-service piping.
 - 4. Install gate valve onto tapping sleeve. Comply with MSS SP-60. Install valve with stem pointing up and with valve box.
- B. Make connections NPS 2 and smaller with drilling machine according to the following:
 - 1. Install service-saddle assemblies and corporation valves in size, quantity, and arrangement required by utility company standards.
 - 2. Install service-saddle assemblies on water-service pipe to be tapped. Position outlets for corporation valves.
 - 3. Use drilling machine compatible with service-saddle assemblies and corporation valves. Drill hole in main. Remove drilling machine and connect water-service piping.
 - 4. Install corporation valves into service-saddle assemblies.
 - 5. Install manifold for multiple taps in water main.
 - 6. Install curb valve in water-service piping with head pointing up and with service box.
- C. Install ductile-iron, water-service piping according to AWWA C600 and AWWA M41.
- D. Install copper tube and fittings according to CDA's "Copper Tube Handbook."
- E. Install PVC, AWWA pipe according to AWWA M23 and ASTM F 645.
- F. Install PE pipe according to ASTM D 2774 and ASTM F 645.
- G. Bury piping with depth of cover over top at least 30 inches, with top at least 12 inches below level of maximum frost penetration.
- H. Extend water-service piping and connect to water-supply source and building water piping systems at outside face of building wall in locations and pipe sizes indicated.
 - 1. Terminate water-service piping at building wall until building water piping systems are installed. Terminate piping with caps, plugs, or flanges as required for piping material. Make connections to building water piping systems when those systems are installed.

- I. Sleeves are specified in Division 15 Section 15050 "Basic Mechanical Materials and Methods."
- J. Install underground piping with restrained joints at horizontal and vertical changes in direction. Use restrained-joint piping, thrust blocks, anchors, tie-rods and clamps, and other supports.
- K. Anchor service-entry piping to building wall.

3.5 ANCHORAGE INSTALLATION

- A. Install anchorages for tees, plugs and caps, bends, crosses, valves, and hydrant branches. Include anchorages for the following piping systems:
 - 1. Gasketed-Joint, Ductile-Iron, Water-Service Piping: According to AWWA C600.
 - 2. Gasketed-Joint, PVC Water-Service Piping: According to AWWA M23.
 - 3. Apply full coat of asphalt or other acceptable corrosion-resistant material to surfaces of installed ferrous anchorage devices.

3.6 VALVE INSTALLATION

- A. Gate Valves: Comply with NFPA 24. Install each underground valve and valves in vaults with stem pointing up and with vertical cast-iron indicator post.

3.7 CONNECTIONS

- A. Piping installation requirements are specified in other Division 2 Sections. Drawings indicate general arrangement of piping and specialties.
- B. Connect water-distribution piping to existing water main.
- C. Connect water-distribution piping to interior domestic-water piping.

3.8 FIELD QUALITY CONTROL

- A. Piping Tests: Conduct piping tests before joints are covered and after thrust blocks have hardened sufficiently. Fill pipeline 24 hours before testing and apply test pressure to stabilize system. Use only potable water.
- B. Hydrostatic Tests: Test at not less than 1-1/2 times working pressure for 2 hours.
 - 1. Increase pressure in 50-psig increments and inspect each joint between increments. Hold at test pressure for 1 hour; decrease to 0 psig. Slowly increase again to test pressure and hold for 1 more hour. Maximum allowable leakage is 2 quarts per hour per 100 joints. Remake leaking

joints with new materials and repeat test until leakage is within allowed limits.

- C. Prepare reports of testing activities.

3.9 IDENTIFICATION

- A. Install continuous underground **detectable** warning tape during backfilling of trench for underground water-service piping. Locate below finished grade, directly over piping. See Division 2 Section 02300 "Earthwork" for underground warning tapes.

3.10 CLEANING

- A. Clean and disinfect water-distribution piping as follows:
 - 1. Purge new water-distribution piping systems and parts of existing systems that have been altered, extended, or repaired before use.
 - 2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed by authorities having jurisdiction, use procedure described in AWWA C651 or as described below:
 - a. Fill system or part of system with water/chlorine solution containing at least 50 ppm of chlorine; isolate and allow to stand for 24 hours.
 - b. Drain system or part of system of previous solution and refill with water/chlorine solution containing at least 200 ppm of chlorine; isolate and allow to stand for 3 hours.
 - c. After standing time, flush system with clean, potable water until no chlorine remains in water coming from system.
 - d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows evidence of contamination.
- B. Prepare reports of purging and disinfecting activities.

END OF SECTION 02510

SECTION 02530 SANITARY SEWERAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes sanitary sewerage outside the building.

1.2 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

1.3 SUBMITTALS

- A. Product Data: For the following:
 - 1. Gravity-Flow sewer pipe and fittings.
- B. Field test reports.

1.4 PROJECT CONDITIONS

- A. Site Information: Perform site survey, and verify existing utility locations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. 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.

2.2 PIPING MATERIALS

- A. Refer to Part 3 "Piping Applications" Paragraph for applications of pipe and fitting materials.

2.3 PIPES AND FITTINGS

- A. Hub-and-Spigot, Cast-Iron Soil Pipe and Fittings: ASTM A 74, gray iron, for gasketed joints.
 - 1. Gaskets: ASTM C 564, rubber, compression type, thickness to match class of pipe.

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- B. Ductile-Iron Sewer Pipe: ASTM A 746, for push-on joints.
 - 1. Standard-Pattern, Ductile-Iron Fittings: AWWA C110, ductile or gray iron, for push-on joints.
 - 2. Compact-Pattern, Ductile-Iron Fittings: AWWA C153, for push-on joints.
 - 3. Gaskets: AWWA C111, rubber.
- C. PVC Sewer Pipe and Fittings: According to the following:
 - 1. PVC Sewer Pipe and Fittings: ASTM D 3034, SDR 35, for solvent-cemented or gasketed joints.
 - a. Gaskets: ASTM F 477, elastomeric seals.
- D. ABS Sewer Pipe and Fittings: According to the following:
 - 1. ABS Sewer Pipe and Fittings,,: ASTM D 2751, SDR 35, for solvent-cemented or gasketed joints.
 - a. Gaskets: ASTM F 477, elastomeric seals.
 - b. Solvent Cement: ASTM D 2235.

2.4 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
 - 1. Cement: ASTM C 150, Type II.
 - 2. Fine Aggregate: ASTM C 33, sand.
 - 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 - 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio.
 - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
 - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.
- C. Structure Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water-cementitious materials ratio. Include channels and benches in manholes.
 - 1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.
 - a. Invert Slope: 2 percent through manhole.

2. Benches: Concrete, sloped to drain into channel.

a. Slope: 4 percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.

2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

2.5 CLEANOUTS

A. Gray-Iron Cleanouts: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug. Use units with top-loading classifications according to the following applications:

1. Light Duty: In earth or grass foot-traffic areas.

2. Medium Duty: In paved foot-traffic areas.

3. Heavy Duty: In vehicle-traffic service areas.

4. Extra-Heavy Duty: In roads.

5. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

B. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

C. ABS Cleanouts: ABS body with ABS threaded plug. Include ABS sewer pipe fitting and riser to cleanout of same material as sewer piping.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Excavating, trenching, and backfilling are specified in Division 2 Section 02300 "Earthwork."

B. Identification: Materials and their installation are specified in Division 2 Section 02300 "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.

1. Use detectable warning tape over ferrous piping.

2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

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- C. Piping Applications: Include watertight joints.
 - 1. NPS 4 and NPS 6: PVC sewer pipe and fittings, gaskets, and gasketed joints.
 - 2. NPS 4 and NPS 6: ABS sewer pipe and fittings, gaskets, and gasketed joints.
- D. Sleeve-Type Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.
- E. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.
- F. 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. Maintain swab or drag in line, and pull past each joint as it is completed.
- G. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- H. Install gravity-flow piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
 - 1. Install piping pitched down in direction of flow, at minimum slope of 2 percent, unless otherwise indicated.
 - 2. Install piping with 24-inch minimum cover.
- I. Extend sanitary sewerage piping and connect to building's sanitary drains, of sizes and in locations indicated. Terminate piping as indicated.
- J. Pipe Joint Construction and Installation: Join and install pipe and fittings according to installations indicated.
 - 1. Hub-and-Spigot, Cast-Iron Soil Pipe and Fittings: With rubber gaskets according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook." Use gaskets that match class of pipe and fittings.
 - 2. Ductile-Iron Sewer Pipe with Ductile-Iron Fittings: According to AWWA C600.
 - 3. PE Pipe and Fittings: As follows:
 - a. Join pipe, tubing, and gasketed fittings with gaskets for watertight joints according to ASTM D 2321 and manufacturer's written instructions.

- b. Install according to ASTM D 2321 and manufacturer's written instructions.
- 4. PVC Sewer Pipe and Fittings: As follows:
 - a. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
 - b. Install according to ASTM D 2321.
- 5. ABS Sewer Pipe and Fittings: As follows:
 - a. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
 - b. Install according to ASTM D 2321.
- 6. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.
- K. Concrete Placement: Place cast-in-place concrete according to ACI 318 and ACI 350R.
- L. Install cleanouts and riser extension from sewer pipe to cleanout at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
- M. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding grade.
- N. Make connections to existing piping and underground structures so finished Work complies as nearly as practical with requirements specified for new Work.
- O. 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.
- P. 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 3000 psi.
- Q. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

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- R. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
 - 1. Place plug in end of incomplete piping at end of day and when work stops.
 - 2. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

3.2 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 - 2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 3. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.
 - 1. Do not enclose, cover, or put into service before inspection and approval by the State's Representative.
 - 2. Test completed piping systems according to State's Representative.
 - 3. Schedule tests and inspections by State's Representative with at least 24 hours' advance notice.
 - 4. Submit separate reports for each test.
 - 5. Perform tests as follows:
 - a. Sanitary Sewerage: Perform hydrostatic test.
 - 1) Allowable leakage is maximum of 50 gal. per inch of nominal pipe size per mile of pipe, during 24-hour period.
 - 2) Close openings in system and fill with water.
 - 3) Purge air and refill with water.
 - 4) Disconnect water supply.
 - 5) Test and inspect joints for leaks.

- 6) Option: Test ductile-iron piping according to AWWA C600, Section "Hydrostatic Testing." Use test pressure of at least 10 psig.
- b. Sanitary Sewerage: Perform air test according to UNI-B-6.
6. Leaks and loss in test pressure constitute defects that must be repaired.
7. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION 02530

SECTION 02540 SEPTIC TANK SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Septic tanks.
 - 2. Septic tank filters.
 - 3. Siphons.
 - 4. Dosing tanks.
 - 5. Distribution boxes.
 - 6. Distribution piping.
 - 7. Leaching piping and chambers.
 - 8. Absorption fill materials.
- B. Related Sections include the following:
 - 1. Division 2 Section 02530 "Sanitary Sewerage" for sanitary sewer piping from building to septic tank.
 - 2. Division 15 Section 15150 "Sanitary Waste and Vent Piping" for sewer piping from building to septic tank.

1.3 DEFINITIONS

- A. ABS: Acrylonitrile-butadiene-styrene plastic.
- B. Absorption Field: Subsurface disposal process.
- C. Absorption Trench: System of single leaching pipes and filtering materials installed in trenches for waste water disposal.
- D. Distribution Piping: Solid pipe and pipe fittings installed with tight joints between septic tank and other septic tank system structures to but not including leaching piping leaching chambers.
- E. HDPE: High-density-polyethylene plastic.
- F. Leaching Piping: Perforated pipe and pipe fittings or plain pipe with open joints in absorption field.

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- G. PE: Polyethylene plastic.
- H. PVC: Polyvinyl chloride plastic.

1.4 SUBMITTALS

- A. Product Data: Include construction details material descriptions, dimensions of individual components and profiles; and finishes. For the following:
 - 1. Septic tanks.
 - 2. Septic tank filters.
 - 3. Distribution boxes.
 - 4. Pipe and fittings
 - 5. Leaching pipe.
 - 6. Manhole with frame and covers.
- B. Shop Drawings: Include manhole openings, covers, pipe connections, and accessories for the following precast reinforced concrete structures:
 - 1. Septic tanks.
 - 2. Distribution boxes.
- C. Coordination Drawings: Show piping, underground structures, and other utilities. Indicate size and invert elevations of piping and structures.

1.5 PROJECT CONDITIONS

- A. Interruption of Existing Septic Tank System Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:
 - 1. Notify State Representative no fewer than two (2) days in advance of proposed interruption of service.
 - 2. Do not proceed with interruption of service without State Representative's written permission.

PART 2 - PRODUCTS

2.1 PRECAST CONCRETE SEPTIC TANKS

- A. Precast Concrete Septic Tanks: ASTM C 1227, two-chamber, precast, reinforced-concrete tank and covers.
 - 1. Design: For traffic loading according to ASTM C 890.
 - 2. Manholes: 24-inch minimum diameter opening with reinforced-concrete risers to grade and access lid with steel lift rings. Include manhole in center of each septic tank compartment top.

3. Filter Access: Reinforced-concrete access hole, large enough to remove filter, over filter position.
4. Inlet and Outlet Access: 12-inch minimum diameter, reinforced-concrete access lids with steel lift rings. Include access centered over inlet and outlet.
5. Resilient Connectors: ASTM C 923 (ASTM C 923M), of size required for piping, fitted into inlet and outlet openings.

2.2 FILTERS

- A. Septic-tank-outlet filter that restricts discharge solids to 1/8 inch is enclosed in HDDE or PVC housing, has a 4 inch outlet pipe connection, and has access from surface for service.

2.3 DISTRIBUTION BOXES

- A. Description: Precast concrete, box and cover.
 1. Design: Made according to ASTM C 913, and for traffic loading according to ASTM C 890.
 2. Manholes: 24-inch minimum diameter opening with reinforced-concrete risers to grade and cover with steel lift rings in center of distribution box cover.
 3. Pipe Connections: ASTM C 923 (ASTM C 923M) resilient connectors, of size required for piping, fitted into inlet and outlet openings. Include watertight plugs in outlets not required.
 4. Coating: Coal Tar Epoxy Coating 15 mil. Minimum thickness covering internal areas above the water line and extending at 4 inches below that point.

2.4 DISTRIBUTION PIPES AND FITTINGS

- A. Refer to Part 3 "Piping Applications" Article for identification of systems where piping materials specified below are used.
- B. Sewer Pipe and Fittings: PVC, complying with ASTM D 3034, SDR 35, nonperforated, for solvent-cement or elastomeric gasket joints.
 1. Solvent Cement: ASTM D 2564.
 2. Gaskets: ASTM F 477, elastomeric seal.
- C. Sleeve-Type Couplings: Rubber or elastomeric sleeve and bond assembly fabricated to match OD of pipes to be joined.
 1. Sleeves for Dissimilar Pipes: Compatible with pipe materials being joined.

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2.5 LEACHING PIPES AND FITTINGS

- A. Pipe and Fittings: PVC, complying with ASTM D 3034, perforated, for gasket joints.
- B. Non-Vehicular-Traffic-Area- Cleanouts: PVC pipe and fittings, ASTM D 3034, SDR 35 non perforated, for solvent-cement or elastomeric gasket joints. Include PVC threaded cleanout ply.

2.6 CLEANOUTS

- A. Cast-Iron Cleanouts: ASME A112.36.2M; with round, flanged, cast-iron housing and secured, scoriated, heavy duty loading class, cast-iron cover, cast-iron ferrule, and countersunk brass cleanout plug.
- B. PVC Cleanouts: PVC pipe fitting for solvent-cement or elastomeric gasket joint with PE or PVC threaded cleanout plug.

2.7 ABSORPTION-TRENCH FILL MATERIALS

- A. Filtering Material: ASTM D 448, Size No. 24, 3/4 to 2-1/2 inches, washed, crushed stone or gravel.
- B. Filter Mat: Geotextile woven or spun filter fabric, in 1 or more layers, for minimum total unit weight of 3 oz./sq. yd.
- C. Fill Material: Soil removed from trench.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Survey the area for septic tank system installation. Located and mark existing utilities, underground structures, and above ground obstructions before beginning and avoid disruption of and damage to services.
- B. Examine soil structure, materials, and conditions.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean exposed surfaces of tanks and other structures and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

3.3 EARTHWORK

- A. Excavating, trenching, and backfilling for distribution pipe and fittings are specified in Division 2 Section 02300 “Earthwork”.
- B. Excavating and Backfilling for septic Tanks: As follows:
 - 1. Excavate sufficient width and length for tanks to a depth determined by tank inlet elevation. Provide level bottom.
 - 2. Backfill with excavated soil, mounding soil above original grade without compacting.
- C. Excavating and Backfilling for Absorption Fields: As follows:
 - 1. Excavate trenches for a single pipe.
 - 2. Backfill absorption trenches immediately after installation with excavated soil, mounding soil above original grade without compacting.

3.4 IDENTIFICATION

- A. Identification materials and their installation are specified in Division 2 Section 02300 “Earthwork.”

3.5 SEPTIC TANK INSTALLATION

- A. Install precast concrete septic tanks level according to ASTM C 891,
- B. Install septic tank filter in each tank.
- C. Fill septic tank with water.
- D. Connect septic tank to concrete ballast pad.

3.6 DISTRIBUTION BOX INSTALLATION

- A. Install reinforced-concrete distribution boxes at invert elevations indicated according to ASTM C 891 and manufacturer’s written instructions. Set level and plumb.

3.7 PIPING APPLICATIONS

- A. Use pipes, fittings, and joining methods, for all piping sizes, according to the following applications:
 - 1. Install solid piping to connect septic tank, dosing tank, distribution box, and header for the absorption field or the piping to seepage pits with closed joints.
 - 2. Install piping for leaching trenches, with perforated pipe. Install perforated pipe with perforations at bottom.

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3.8 PIPE JOINT CONSTRUCTION AND PIPING INSTALLATION

- A. Join gasketed PVC pipe and fittings with elastomeric seals according to ASTM D 3212.
- B. Install distribution PVC piping according to ASTM D 2321.
- C. Install leaching PVC piping according to ASTM D 2321 and ASTM F 481.
- D. Join dissimilar pipe materials with standard manufactured couplings and fittings made for that purpose.

3.9 ABSORPTION FIELD INSTALLATION

- A. Install leaching piping solidly bedded in filtering material, with full bearing for each pipe section throughout its length. Maintain pipe alignment with no slope.
 - 1. Install perforated pipe with perforations down and joints tightly closed. Install collars and couplings as required.
 - 2. Install elbow fittings with tight joints.
 - 3. Place additional filtering material around sides to a minimum depth of 6 inches above the top of leaching piping.
- B. Install filter mat over filter material before backfilling.
- C. Provide perforated monitor well pipe with cap extending from bottom of trench and terminating as shown on the plans.

3.10 CLEANOUT INSTALLATION

- A. Install cleanouts and extension from piping to cleanout at grade as indicated. Use 4-inch PVC pipe with threaded PVC cap. Set top of cleanout 2 inches above surrounding grade.
- B. Refer to Division 3 Section 03300 "Cast-in-Place Concrete" for formwork, reinforcement, and concrete.

3.11 CONNECTIONS

- A. Connect sanitary sewerage piping to septic tank.
- B. Connect piping between septic tank system structures and absorption fields.

3.12 FIELD QUALITY CONTROL

- A. System Tests: Fill underground structures with water and let stand overnight. If water level recedes, locate and repair leaks and retest. Repeat tests and repairs until there is no leakage.

3.13 CLEANING

- A. Clear interior of piping and structures of dirt and other superfluous material as work progresses.
- B. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plugs in ends of uncompleted pipe at end of workday or when work stops.

END OF SECTION 02540

SECTION 02630 STORM DRAINAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes storm drainage outside the building.

1.2 PERFORMANCE REQUIREMENTS

- A. Gravity-Flow, Nonpressure-Piping Pressure Ratings: At least equal to system test pressure.

1.3 SUBMITTALS

- A. Product Data: For cleanouts, and drains indicated.

1.4 PROJECT CONDITIONS

- A. Site Information: Perform site survey, research public utility records, and verify existing utility locations.

PART 2 - PRODUCTS

2.1 PIPES AND FITTINGS

- A. Ductile-Iron Sewer Pipe: ASTM A 746, for push-on joints.
 - 1. Standard-Pattern, Ductile-Iron Fittings: AWWA C110, ductile or gray iron, for push-on joints.
 - 2. Compact-Pattern, Ductile-Iron Fittings: AWWA C153, for push-on joints.
 - 3. Gaskets: AWWA C111, rubber.
- B. Corrugated PE Drainage Tubing and Fittings: AASHTO M 252, Type S, with smooth waterway for coupling joints.
 - 1. Soiltight Couplings: AASHTO M 252, corrugated, matching tube and fittings to form soiltight joints.
 - 2. Silttight Couplings: PE sleeve with ASTM D 1056, Type 2, Class A, Grade 2 gasket material that mates with tube and fittings to form silttight joints.
- C. PVC Sewer Pipe and Fittings: According to the following:

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1. PVC Sewer Pipe and Fittings, NPS 15 and Smaller: ASTM D 3034, SDR 35, for solvent-cemented or gasketed joints.
 - a. Gaskets: ASTM F 477, elastomeric seals.
2. PVC Sewer Pipe and Fittings, NPS 18 and Larger: ASTM F 679, T-1 wall thickness, bell and spigot for gasketed joints.
 - a. Gaskets: ASTM F 477, elastomeric seals.

2.2 CATCH BASINS

- A. Normal-Traffic, Precast Concrete Catch Basins: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.
 1. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
 2. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
 3. Gaskets: ASTM C 443, rubber.
 4. Pipe Connectors: ASTM C 923, resilient, of size required, for each pipe connecting to base section.
- B. Frames and Grates: ASTM A 536, Grade 60-40-18, ductile iron designed for heavy-duty service. Include flat grate with small square or short-slotted drainage openings.
 1. Size: 24 by 24 inches minimum, unless otherwise indicated.
 2. Grate Free Area: Approximately 50 percent, unless otherwise indicated.

2.3 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R.
 1. Cement: ASTM C 150, Type II.
 2. Fine Aggregate: ASTM C 33, sand.
 3. Coarse Aggregate: ASTM C 33, crushed gravel.
 4. Water: Potable.
- B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water-cementitious ratio.
 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

- C. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water-cementitious ratio.
 - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
 - 2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

2.4 PROTECTIVE COATINGS

- A. Description: 1- or 2-coat, coal-tar epoxy; 15-mil minimum thickness, unless otherwise indicated; factory or field applied to the following surfaces:
 - 1. Catch Basins: On exterior and interior surfaces.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating, trenching, backfilling, and identification materials and their installation are specified in Division 2 Section 02300 "Earthwork." Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.
 - 1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

3.2 PIPING APPLICATIONS

- A. Piping Applications: Include watertight, silttight, or soiltight joints.
 - 1. NPS 4 and NPS 6: (DN 100 and DN 150) PVC sewer pipe and fittings, gaskets, and gasketed joints.
 - 2. NPS 18 to NPS 36: Ductile-iron culvert pipe; standard-pattern, cast-iron or ductile-iron fittings; gaskets; and gasketed joints.
 - 3. NPS 18 to NPS 36: PVC sewer pipe and fittings, gaskets, and gasketed joints.

3.3 SPECIAL PIPE COUPLINGS

- A. Sleeve-Type Pipe Couplings: Use where required to join piping and no other appropriate method is specified. Do not use instead of specified joining methods.

3.4 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical.

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- B. 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 use of lubricants, cements, and other installation requirements. Maintain swab or drag in line, and pull past each joint as it is completed.
- C. Use proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- D. Install gravity-flow piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.
 - 1. Install piping pitched down in direction of flow, at minimum slope of 1 percent, unless otherwise indicated.
 - 2. Install piping with 36-inch minimum cover.
- E. Extend storm drainage piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

3.5 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. Join and install pipe and fittings according to installations indicated.
- B. Refer to Division 2 Section "Utility Materials" for basic piping joint construction and installation.
- C. PE Pipe and Fittings: As follows:
 - 1. Join pipe, tubing, and fittings with couplings for soiltight joints according to manufacturer's written instructions.
 - 2. Install according to ASTM D 2321 and manufacturer's written instructions.
 - 3. Install corrugated piping according to the Corrugated Polyethylene Pipe Association's "Recommended Installation Practices for Corrugated Polyethylene Pipe and Fittings."
- D. PVC Sewer Pipe and Fittings: As follows:
 - 1. Join pipe and gasketed fittings with gaskets according to ASTM D 2321.
 - 2. Install according to ASTM D 2321.
- E. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and that fit both systems' materials and dimensions.

3.6 CATCH-BASIN INSTALLATION

- A. Set frames and grates to elevations indicated.

3.7 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318 and ACI 350R.

3.8 DRAINAGE SYSTEM INSTALLATION

- A. Install drains in locations indicated.
 - 1. Embed drains in 4-inch minimum depth of concrete around bottom and sides.
 - 2. Set drain frames and covers with tops flush with pavement surface.
- B. Make connections to existing piping and underground structures so finished Work complies as nearly as practical with requirements specified for new Work.
- C. 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.

3.9 FIELD QUALITY CONTROL

- A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.
 - 1. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 - 2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
 - 3. Reinspect and repeat procedure until results are satisfactory.
- B. Test new piping systems according to authorities having jurisdiction.

3.10 PROTECTION AND CLEANING

- A. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

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- B. Clear interior of piping and structures of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed.
 - 1. Place plug in end of incomplete piping at end of day and when work stops.
 - 2. Flush piping between manholes and other structures to remove collected debris, if required by authorities having jurisdiction.

END OF SECTION 02630

SECTION 02741 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 F for oil-based materials, 50 deg F for water-based materials, and not exceeding 95 deg F.

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Hot-Mix Asphalt Paving

PART 2 - PRODUCTS

2.1 AGGREGATES

- A. Aggregates shall conform 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
 2. For AC dikes: PG 70-10.
- 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 @ 135°C Maximum, Pa·s	T316	3.0	3.0	3.0	3.0
Dynamic Shear, Test Temp at 10 rads/s, °C 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, °C Min G	T315	64 2.20	64 2.20	64 2.20	70 2.20
Ductility @ 25 °C Min, cm	T51	75	75	75	75
PAV Aging, Temp °C	R28	100	100	100	110
RTFO TEST AND PAV AGED BINDER					
Dynamic Shear Test Temp at 10 rads/s, °C Min G	T315	31 5000	28 5000	22 5000	34 5000
Creep Stiffness Test Temp, °C 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 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.

2.4 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.

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Hot-Mix Asphalt Paving

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 inches into 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 feet wide 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.

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Hot-Mix Asphalt Paving

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-foot straightedge 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 striping 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 00804.

END OF SECTION 02741

SECTION 02751 CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes cement concrete pavement for the following applications:
 - 1. Walkways.
 - 2. Curbs and gutters.

1.2 SUBMITTALS

- A. Product Data: For each manufactured material and product indicated.
- B. Design Mixes: For each concrete mix indicated.
- C. Material certificates.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Manufacturer of ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- B. ACI Publications: Comply with ACI 301, "Specification for Structural Concrete," unless modified by the requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 STEEL REINFORCEMENT

- A. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed.
- B. Plain Steel Wire: ASTM A 82, as drawn.
- C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening steel reinforcement. Manufacture bar supports according to CRSI's "Manual of Standard Practice."

2.2 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II.
 - 1. Fly Ash: ASTM C 618, Class F or C.
 - 2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.

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Cement Concrete Pavement

- B. Aggregate: ASTM C 33, uniformly graded, from a single source.
- C. Water: ASTM C 94.
- D. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete pavement, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inch long.
- E. Admixtures: Certified by manufacturer to contain not more than 0.1 percent water-soluble chloride ions by mass of cement and to be compatible with other admixtures, as follows:
 - 1. Air-Entraining Admixture: ASTM C 260.
 - 2. Water-Reducing Admixture: ASTM C 494, Type A.
 - 3. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
 - 4. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
 - 5. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
- F. Curing Materials:
 - 1. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. dry.
 - 2. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
 - 3. Water: Potable.
 - 4. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
 - 5. Clear Solvent-Borne Liquid-Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
 - 6. Clear Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
 - 7. White Waterborne Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B.
- G. Related Materials:
 - 1. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, or ASTM D 1752, cork or self-expanding cork.
 - 2. Coloring Agent: ASTM C 979, synthetic mineral-oxide pigments or colored water-reducing admixtures; color stable, nonfading, and resistant to lime and other alkalis.

2.3 CONCRETE MIXES AND MIXING

- A. Concrete Mixes: Prepare design mixes, proportioned according to ACI 211.1 and ACI 301, with the following properties:
 - 1. Compressive Strength (28 Days): 3500 psi.

2. Maximum Water-Cementitious Materials Ratio: 0.50.
 3. Slump Limit: 4 inches.
 4. Air Content: 4.5 to 7.5 percent.
- B. Synthetic Fiber: Uniformly disperse in concrete mix at manufacturer's recommended rate, but not less than 1.0 lb/cu. yd.
- C. Coloring Agent: Add coloring agent to mix according to manufacturer's written instructions.
- D. Ready-Mixed Concrete: Comply with requirements and with ASTM C 94 and ASTM C 1116.
- E. Project-Site Mixing: Comply with requirements and measure, batch, and mix concrete materials and concrete according to ASTM C 94. Mix concrete materials in appropriate drum-type batch machine mixer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Surface Preparation: Proof-roll prepared subbase, and remove loose material from surface.
- B. Forms: Set, brace, and secure edge forms, bulkheads, and intermediate screed guides for pavement to required lines, grades, and elevations.
- C. Reinforcement: Accurately position and support reinforcement, and secure against displacement. Set wire ties with ends directed into concrete.
- D. Joints: Locate and install construction, isolation, contraction, and expansion joints as indicated.
- E. Concrete Placement: Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete. Place concrete in a continuous operation within planned joints or sections.
1. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
 2. Consolidate concrete by mechanical vibrating equipment supplemented by hand-spading, rodding, or tamping according to recommendations in ACI 309R.
 3. Screed and initial-float concrete surfaces with darby or bull float before excess moisture or bleed water appears on the surface.
 4. Protect concrete from cold or hot weather during mixing, placing, and curing.

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- F. Evaporation Retarder: Apply 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.
- G. Pavement Tolerances: Comply with tolerances in ACI 330.1, "Specification for Plain Concrete Parking Lots."

3.2 FINISHES AND CURING

- A. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and the concrete surface has stiffened sufficiently to permit operations. Float surfaces to true planes with gaps below 10-foot long, unlevelled straightedge not to exceed 1/4 inch. Cut down high spots, and fill low spots. Refloat surface immediately to uniform granular texture.
 - 1. 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.
- B. Curing: Begin curing after finishing concrete, but not before free water has disappeared from concrete surface. Cure concrete by one or a combination of the following methods:
 - 1. Moisture cure concrete by water, continuous fog spray, continuously wet absorptive cover, or by moisture-retaining-cover curing. Keep surfaces continuously moist for not less than seven days.
 - 2. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

3.3 REPAIRS AND PROTECTION

- A. Remove and replace concrete pavement that is broken, damaged, or defective, or does not meet requirements in this Section.
- B. Protect concrete from damage. Exclude traffic from pavement for at least 14 days after placement.
- C. Maintain concrete pavement free of stains, discoloration, dirt, and other foreign material. Sweep concrete pavement not more than two days before date scheduled for Substantial Completion inspections.

END OF SECTION 02751

SECTION 02821
CHAIN-LINK FENCES AND GATES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Galvanized steel chain-link fabric.
 - 2. Galvanized steel framework.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Shop Drawings: Show locations, components, materials, dimensions, sizes, weights, finishes of components, installation and operational clearances, gate swings, and details of post anchorage and attachment and bracing.

1.3 QUALITY ASSURANCE

- A. Emergency Access Requirements: Comply with requirements of authorities having jurisdiction for automatic gate operators serving as a required means of access.

PART 2 - PRODUCTS

2.1 CHAIN-LINK FENCE FABRIC

- A. Steel Chain-Link Fence Fabric: Comply with Chain Link Fence Manufacturers Institute's "Product Manual."
 - 1. Mesh and Wire Size: 2-inch mesh, 0.120-inch diameter.
- B. Fabric Selvage: Knuckled top and bottom.

2.2 INDUSTRIAL FENCE FRAMING

- A. Round Steel Pipe: Standard weight, Schedule 40, galvanized steel pipe complying with ASTM F 1083. ASTM F 1043, Material Design Group IA, external and internal coating Type A, consisting of not less than 1.8-oz. /sq. ft. zinc; and line, end, corner, and pull posts and top rail as required for Heavy Industrial Fence.
- B. Post Brace Rails: Match top rail for coating and strength and stiffness requirements. Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each

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Chain-Link Fences and Gates

with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.

- C. Top Rails: With swaged-end or fabricated for expansion-type coupling.
- D. Intermediate Rails: Match top rail for coating and strength and stiffness requirements.
- E. Bottom Rails: Match top rail for coating and strength and stiffness requirements.

2.3 TENSION WIRE AND FITTINGS

- A. Metallic-Coated Steel Tension Wire: 0.177-inch- diameter, marcelled tension wire complying with ASTM A 824 at locations indicated.
- B. Fittings: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

2.4 CAST-IN-PLACE CONCRETE

- A. General: Comply with ACI 301 for cast-in-place concrete; materials consisting of portland cement complying with ASTM C 150, aggregates complying with ASTM C 33, and potable water.
 - 1. Concrete Mixes: Normal-weight concrete with not less than 3000-psi compressive strength (28 days), 4-inch slump, and 1-inch maximum size aggregate.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements indicated. Do not begin installation before final grading is completed, unless otherwise permitted by Architect.
- B. Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.
- C. Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil.
 - 1. Concrete Footings: Place concrete around posts and vibrate or tamp for consolidation. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured. Set the following post types

in concrete footings and protect portion of posts aboveground from concrete splatter:

- a. Terminal.
 - b. Line; Using mechanical devices to set line posts per ASTM F 567 is permitted.
 - c. Gate.
- D. Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment of 2 ½" min. outside dimension.
- E. Line Posts: Space line posts uniformly at 10 feet o.c., 2 3/8" min. outside dimension.
- F. Bottom Rails: Install, spanning between posts, using fittings and accessories.
- G. Chain-Link Fabric: Apply fabric to outside of enclosing framework.
- H. Tie Wires: Attach wire to chain-link fabric per ASTM F 626. Tie fabric to line posts at maximum interval of 12 inches o.c. and to braces at maximum interval of 24 inches o.c.

END OF SECTION 02821

SECTION 02870
SITE FURNISHINGS and ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Picnic Tables
2. Truncated Domes

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Samples: For each type of exposed finish and for each color and texture required.

1. Provide full range of manufacturer's standard colors for table selection by State's Representative prior to installation.

C. Maintenance data.

D. Warranties

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products and manufacturer's specified.

2.2 MATERIALS

A. Anchors, Fasteners, Fittings, and Hardware: Commercial quality; tamperproof, vandal and theft resistant; concealed, recessed, and capped or plugged. Provide as required for site and street furnishings' assembly, mounting, and secure attachment.

1. Material Galvanized steel or Manufacturer's standard, corrosion-resistant-coated or noncorrodible materials.
2. Angle Anchors: For inconspicuously bolting legs of site and street furnishings to on-grade substrate.

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Site and Street Furnishings

3. Antitheft Hold-Down Brackets: For securing site and street furnishings to substrate.

2.3 PICNIC TABLE

- A. Concrete table with top, benches and table supports cast in one integral piece. Table tops shall be 92 inches long by a minimum of 33 inches wide. Height of table top surface shall be 32 inches from finish grade. Table benches shall be 92 inches long by 10.5 inches wide with a height of 18 inches from finish grade to top of bench.
 1. Product: Accessible Outdoor Creations Picnic Table, Model 1002, or approved equivalent. Available from Outdoor Creations, P.O. Box 50, Round Mountain, CA 96084, 530-337-6774.
 2. Product: Accessible Universal Precast Concrete Inc., P.O. Box 6431296, San Jose, CA 95153-1296, 408-799-8888, Model PT 9636 or equivalent.
 3. State parks logo inset into table supports.
- B. Thickness: Minimum thickness of all areas to be 4 inches.
- C. Weight: Minimum 2,450 lbs.
- D. Installation Method: Freestanding.
- E. Color: Pure mineal oxides mixed integrally with cement. Color as selected from manufacturer's standard color range by State's Representative.
- F. Concrete Mix Design: 8.5 sacks Portland cement per yard with maximum rock size of $\frac{3}{4}$ " reinforced with #4 and #5 rebar grid, fabricated so that a continuous connection is made between table tops and seats and table legs. Rebar frame set a minimum of 2 inches from outside edges. Cured concrete shall attain minimum compressive strength of 7,000 psi at 28 days.
- G. Finish: manufacturer applied clear concrete graffiti-resistance sealer to all exposed surfaces. All formed surfaces and edges shall be fully rounded and smooth.
- H. Warranty: Ten-year vandal-proof guarantee that will replace the table in the event of destructive vandalism.

2.4 TRUNCATED DOMES

- B. As manufactured by Armor-tile Company, (800) 682-2525, Federal Yellow color number 33528.

- B. Or Equivalent.

PART 3 - EXECUTION

3.1 HANDLING

- A. Transport, store and handle precast units and manufactured items in a manner to avoid damage. Store units free of the ground. Cover unit, secure cover firmly, and protect units from staining materials.

3.2 INSTALLATION

- A. Complete field assembly of site and street furnishings, where required.
- B. Set all work true and square, plumb and level.
- C. Unless otherwise indicated, install site and street furnishings after planting and paving have been completed.
- D. Truncated Domes:
 - 1. Truncated dome warning panels shall be Federal Yellow color and surface mounted, as manufactured by ADA solutions, Inc. or approved equal. Panels shall be mechanically fastened and adhered to the underlying surface using 1/4" x 5/8" yellow composite sleeve anchors with SS pins. Sealant is Sonneborn NP1, Sikaflex 1a, or approved equal.
 - 2. Install domes on 4" thick concrete slabs (minimum), sloped to meet the ADA ramp grades as diagrammed on the documents. Install plumb, true and securely anchored positioned.

3.3 CLEAN UP

- A. Clean up per section 01700.

END OF SECTION 02870

SECTION 03300 CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes cast-in-place concrete, including reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. See Division 2 Section 02300 "Earthwork" for drainage fill under slabs-on-grade.

1.2 SUBMITTALS

- A. Product Data: For each manufactured material and product indicated.
- B. Design Mixes: For each concrete mix indicated.
- C. Shop Drawings: Include details of steel reinforcement placement including material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports.
- D. Material certificates and test reports.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- B. Comply with ACI 301, "Specification for Structural Concrete," including the following, unless modified by the requirements of the Contract Documents.
 - 1. General requirements, including submittals, quality assurance, acceptance of structure, and protection of in-place concrete.
 - 2. Formwork and form accessories.
 - 3. Steel reinforcement and supports.
 - 4. Concrete mixtures.
 - 5. Handling, placing, and constructing concrete.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Formwork: Furnish formwork and form accessories according to ACI 301.
- B. Steel Reinforcement:

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Cast-In-Place Concrete

1. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
2. Plain-Steel Welded Wire Fabric: ASTM A 185, fabricated from as-drawn steel wire into flat sheets.
3. Deformed-Steel Welded Wire Fabric: ASTM A 497, flat sheet.

C. Concrete Materials:

1. Portland Cement: ASTM C 150, Type I or II.
2. Normal-Weight Aggregate: ASTM C 33, uniformly graded, not exceeding 1-1/2-inch nominal size.
3. Water: Complying with ASTM C 94.
4. Synthetic Fiber: Fibrillated or monofilament polypropylene fibers engineered and designed for use in concrete, complying with ASTM C 1116, Type III, 1/2 to 1-1/2 inches (13 to 38 mm) long.

D. Admixtures:

1. Air-Entraining Admixture: ASTM C 260.

E. Vapor Barrier: Multi-ply reinforced polyethylene sheet, ASTM D 4397, not less than 10 mils thick.

1. Fine-Graded Granular Material: Clean mixture of crushed stone, crushed gravel, and manufactured or natural sand; ASTM D 448, Size 10, with 100 percent passing a No. 4 sieve and 10 to 30 percent passing a No. 100 sieve; complying with deleterious substance limits of ASTM C 33 for fine aggregates.

F. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.

G. Curing Materials:

1. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
2. Water: Potable.

2.2 CONCRETE MIXES

A. Comply with ACI 301 requirements for concrete mixtures.

B. Prepare design mixes, proportioned according to ACI 301, for normal-weight concrete determined by either laboratory trial mix or field test data bases, as follows:

1. Compressive Strength (28 Days): 3000 psi (20.7 MPa).
2. Slump: 4 inches.

- C. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having an air content of 2.5 to 4.5 percent
 - 1. Air content of trowel-finished interior concrete floors shall not exceed 3.0 percent.

2.3 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with ASTM C 94.
 - 1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.
- B. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mix type, mix time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Formwork: Design, construct, erect, shore, brace, and maintain formwork according to ACI 301.
- B. Vapor Barrier: Install, protect, and repair vapor barrier sheets according to ASTM E 1643; place sheets in position with longest dimension parallel with direction of pour.
 - 1. Lap joints 6 inches and seal with manufacturers recommended tape.
 - 2. Cover vapor barrier with fine-graded granular material, moisten, and compact with mechanical equipment to elevation tolerances of plus 0 inch or minus 3/4 inch.
- C. Steel Reinforcement: Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.
 - 1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- D. Joints: Construct joints true to line with faces perpendicular to surface plane of concrete.
 - 1. Construction Joints: Locate and install so as not to impair strength or appearance of concrete, at locations indicated or as approved by

State Representative. Maintain on-hand materials as necessary, and install construction joint whenever interruptions of concrete placement may otherwise result in a cold joint.

2. Isolation Joints: Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
 - a. Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
3. Contraction Joints in Slabs-on-Grade: 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, as follows:
 - a. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint with groover tool to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover marks on concrete surfaces.
 - b. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

- E. Tolerances: Comply with ACI 117, "Specifications for Tolerances for Concrete Construction and Materials. "A 1/8" to 1/4" maximum variation measured with a 10' straight edge.

3.2 CONCETE PLACEMENT

- A. Comply with recommendations in ACI 304R for measuring, mixing, transporting, and placing concrete.
- B. Do not add water to concrete during delivery, at Project site, or during placement.
 1. Consolidate concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.

3.3 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched, and fins and other projections exceeding 1/4 inch in height rubbed down or chipped off.

1. Apply to concrete surfaces not exposed to public view.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Completely remove fins and other projections.
1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, dampproofing, veneer plaster, or painting.
 2. Do not apply rubbed finish to smooth-formed finish.
 3. Apply smooth-rubbed finish, defined in ACI 301, to smooth-formed finished concrete.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.4 FINISHING UNFORMED SURFACES

- A. General: Comply with ACI 302.1R for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Screed surfaces with a straightedge and strike off. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane before excess moisture or bleedwater appears on the surface.
1. Do not further disturb surfaces before starting finishing operations.
- C. Scratch Finish: Apply scratch finish to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quarry tile, portland cement terrazzo, and other bonded cementitious floor finish, unless otherwise indicated.
- D. Float Finish: Apply float finish to surfaces indicated, to surfaces to receive trowel finish, and to floor and slab surfaces to be covered with fluid-applied or sheet waterproofing, built-up or membrane roofing, or sand-bed terrazzo.
- E. Trowel Finish: Apply a hard trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
- F. Trowel and Fine-Broom Finish: Apply a partial trowel finish, stopping after second troweling, to surfaces indicated and to surfaces where ceramic or

quarry tile is to be installed by either thickset or thin-set methods. Immediately after second troweling, and when concrete is still plastic, slightly scarify surface with a fine broom.

- G. Nonslip Broom Finish: Apply a nonslip broom finish to surfaces indicated and to exterior concrete platforms, steps, and ramps. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route.

3.5 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection, and follow recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions occur 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.
- C. Begin curing after finishing concrete, but not before free water has disappeared from concrete surface.
- D. Cure formed and unformed concrete for at least seven days as follows:
 - 1. Moisture Curing: Keep surfaces continuously moist with continuous water-fog spray.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3.6 FIELD QUALITY CONTROL

- A. Testing Agency: The State will engage a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement. Tests will be performed according to ACI 301.
 - 1. Testing Frequency: One composite sample for each day's pour of each concrete mix exceeding 5 cu. yd, but less than 25 cu. yd, plus one set for each additional 50 cu. yd. or fraction thereof.
 - 2. Testing Frequency: At least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mix placed each day.

END OF SECTION 03300

SECTION 08520 ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes horizontal-sliding windows.

1.2 PERFORMANCE REQUIREMENTS

- A. General: Provide aluminum windows capable of complying with performance requirements indicated, based on testing manufacturer's windows that are representative of those specified and that are of minimum test size required by AAMA/NWWDA 101/I.S.2.
- B. Structural Performance: Provide aluminum windows capable of withstanding the following, including wind loads based on passing AAMA/NWWDA 101/I.S.2, Uniform Load Structural Test, at basic wind speed indicated:
 - 1. Deflection: Based on passing AAMA/NWWDA 101/I.S.2, Uniform Load Deflection Test or on glass framing system designed to limit lateral deflections of glass edges to less than 1/175 of glass-edge length or 3/4 inch, whichever is less, at design pressure based on structural computations.
 - 2. Basic Wind Speed: Determine wind loads and resulting design pressures applicable to Project according to ASCE 7, "Minimum Design Loads for Buildings and Other Structures," Section 6.4.2, "Analytic Procedure"; based on mean roof heights above grade as indicated on Drawings.
- C. Window Air Leakage, ASTM E 283: Window air leakage when tested at 1.57 psf (25 mph) shall be 0.25 sfm/SF of frame or less.
- D. Window Water Penetration, ASTM E 547: No water penetration through window when tested under static pressure of 4.5 psf (42 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per square foot.
- E. Solar Heat-Gain Coefficient: Provide aluminum windows with a whole-window SHGC maximum of .75 determined according to NFRC 200 procedures.
- F. Thermal Movements: Provide aluminum windows, including anchorage, that accommodate thermal movements of units resulting from the following maximum change (range) in ambient and surface temperatures without buckling, distortion, opening of joints, failure of joint sealants, damaging loads and stresses on glazing and connections, and other detrimental effects. Base engineering calculation on actual surface temperatures of materials due to solar heat gain and nighttime-sky heat loss.

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Aluminum Windows

1. Temperature Change (Range): 120 deg F ambient material surfaces.

G. Life-Cycle Testing: Test according to AAMA 910 and comply with AAMA/NWWDA 101/I.S.2.

H. Specific Product Performance Requirements: Comply with Section 2.2 of AAMA/NWWDA 101/I.S.2 as applicable to types of aluminum windows indicated.

1.3 SUBMITTALS

A. Product Data: For each type of aluminum window indicated.

B. Shop Drawings: Include plans, elevations, sections, details, hardware, attachments to other Work, and operational clearances.

1. Include structural analysis data indicating structural test pressures and design pressures from basic wind speeds indicated and deflection limitations of glass framing systems, signed and sealed by the qualified professional engineer responsible for their preparation.

C. Field quality-control test reports.

D. Product test reports.

E. Maintenance data.

1.4 QUALITY ASSURANCE

A. Installer: A qualified installer, approved by manufacturer to install manufacturer's products.

B. Fenestration Standard: Comply with AAMA/NWWDA 101/I.S.2, "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors," for minimum standards of performance, materials, components, accessories, and fabrication unless more stringent requirements are indicated.

C. Glazing Publications: Comply with published recommendations of glass manufacturers and GANA's "Glazing Manual" unless more stringent requirements are indicated.

1.5 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace aluminum windows that fail in materials and workmanship within two years from date of Substantial Completion.

B. Warranty Period for Metal Finishes: Five years from date of Substantial Completion.

- C. Warranty Period for Glass: Five years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Acorn Window Systems.
 2. Boyd Aluminum Manufacturing.
 3. Custom Window Company.
 4. Fleetwood Aluminum Products, Inc.
 5. Peerless Products, Inc.
 6. Reynolds Architectural Systems; Ramco Mfg. Co.
 7. Thermal Windows, Inc.
 8. TRACO.
 9. Winco Manufacturing Co.
 10. or equivalent.

2.2 GLAZING

- A. Glass and Glazing Materials: Refer to Division 8 Section 08800 "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.
- B. Glass: Clear, insulating-glass.
- C. Glazing System: Manufacturer's standard factory-glazing system that produces weathertight seal.

2.3 INSECT SCREENS

- A. General: Design windows and hardware to accommodate screens in a tight-fitting, removable arrangement, with a minimum of exposed fasteners and latches. Locate screens on inside of window and provide for each operable exterior sash or ventilator.
1. Aluminum Tubular Frame Screens: Comply with SMA 1004, "Specifications for Aluminum Tubular Frame Screens for Windows," .
- B. Aluminum Insect Screen Frames: Manufacturer's standard aluminum alloy complying with SMA 1004. Fabricate frames with mitered or coped joints,

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concealed fasteners and removable PVC spline/anchor concealing edge of frame.

1. Aluminum Tubular Framing Sections and Cross Braces: Roll formed from aluminum sheet with minimum wall thickness as required for class indicated.
2. Finish: Match aluminum window members.

2.4 FABRICATION

- A. General: Fabricate aluminum windows, in sizes indicated, that comply with requirements and that meet or exceed AAMA/NWWDA 101/I.S.2 performance requirements for the following window type and performance class. Include a complete system for assembling components and anchoring windows.
- B. Fabricate aluminum windows that are reglazable without dismantling sash or ventilator framing.
- C. Weather Stripping: Provide full-perimeter weather stripping for each operable sash and ventilator.
- D. Weep Holes: Provide weep holes and internal passages to conduct infiltrating water to exterior.
- E. Provide water-shed members above side-hinged ventilators and similar lines of natural water penetration.

2.5 FINISHES

- A. Aluminum Anodic Finish: Class I, clear anodic coating complying with AAMA 611.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install windows level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.
- B. Set sill members in bed of sealant or with gaskets, as indicated, for weathertight construction.
- C. Install windows and components to drain condensation, water penetrating joints, and moisture migrating within windows to the exterior.

- D. Metal Protection: Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials by complying with requirements specified in "Dissimilar Materials" Paragraph in Appendix B in AAMA/NWWDA 101/I.S.2.
- E. Adjust operating sashes and ventilators, screens, and hardware for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.
- F. Protect window surfaces from contact with contaminating substances resulting from construction operations. In addition, monitor window surfaces adjacent to and below exterior concrete and masonry surfaces during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances do contact window surfaces, remove contaminants immediately according to manufacturer's written recommendations.
- G. Clean aluminum surfaces immediately after installing windows. Avoid damaging protective coatings and finishes. Remove excess sealants, glazing materials, dirt, and other substances.
- H. Clean factory-glazed glass immediately after installing windows. Comply with manufacturer's written recommendations for final cleaning and maintenance. Remove nonpermanent labels and clean surfaces.
- I. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION 08520

SECTION 08710
DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Commercial door hardware.
 - 2. Unless otherwise accepted by the State's Representative, furnish all finish hardware described in the Hardware Schedule and all other finish hardware not described but required for a complete and operable facility.
- B. Work included:
 - 1. Furnish finish hardware required to complete the Work as shown on the drawings and as specified herein;
 - 2. Furnish trim attachments and fastenings, specified or otherwise required, for proper and complete installation;
 - 3. Deliver to the job site those items of finish hardware scheduled to be installed at the job site; and deliver to other points of installation those items of finish hardware scheduled to be factory installed.

1.2 SUBMITTALS

- A. Before any finish hardware is ordered or purchased for this work, submit to the State for its acceptance, a complete hardware schedule listing all openings by groups of all finish hardware proposed to be furnished for this work, including catalog cuts for each item, giving manufacturer's name, catalog number, finish, and size.
- B. Manufacturer's Recommendations: Prior to installation, deliver to all installing personnel complete recommendations and templates from the manufacturer's regarding installation methods.
- C. Product Data: For each product indicated.
- D. Samples: For each exposed finish.
- E. Door Hardware Schedule: Organized into door hardware sets indicating type, style, function, size, label, hand, manufacturer, fasteners, location, and finish of each door hardware item. Include description of each electrified door hardware function, including sequence of operation.
- F. Keying Schedule: Detail Owner's final keying instructions for locks.
- G. Product certificates.

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Door Hardware

1.3 QUALITY ASSURANCE

- A. Supplier Qualifications: Person who is or employs a qualified DHI Architectural Hardware Consultant.
- B. Keying Conference: Conduct conference at Project site or Parks Headquarters. Incorporate keying conference decisions into final keying schedule.
- C. Keys: Deliver keys to Owner by registered mail.
- D. Templates: Obtain and distribute templates for doors, frames, and other work specified to be factory prepared for installing door hardware.
- E. Standards: Comply with BHMA A156 series standards, Grade 1.
- H. Certified Products: Provide door hardware that is listed in BHMA directory of certified products.

1.4 PRODUCT HANDLING

- A. Packaging:
 - 1. Package each item individually, complete with screws, keys, wrenches, etc., and instructions and templates required for installation, attachment, and adjustment. Properly warp and cushion each item to prevent scratches during delivery and storage.
 - 2. Mark each container with number of door to which item is to be applied, and with number corresponding to item number on Contractor's hardware schedule.

1.5 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within warranty period.
 - 1. Warranty Period for Manual Closers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Product: Subject to compliance with requirements, provide the product named for each door hardware item indicated in Door Hardware Sets.

- B. Basis-of-Design Product: Product named for each door hardware item indicated in Door Hardware Sets establishes the basis of design. Provide either the named product or a comparable product by one of the manufacturers specified for each type of hardware item (upon acceptance by The District).

2.2 DOOR HARDWARE

- A. Scheduled Door Hardware: Provide door hardware according to Door Hardware Sets at the end of Part 3, Manufacturers' names are abbreviated.

2.3 PIVOTS AND HINGES

- A. Manufacturers:

1. Hinges:

- a. Baldwin Hardware Corporation (BH).
- b. Hager Companies (HAG).
- c. Lawrence Brothers, Inc. (LB).
- d. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK).
- e. PBB, Inc. (PBB).
- f. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
- g. Stanley Commercial Hardware; Div. of The Stanley Works (ST).
- h. Or equivalent.

2. Pivots and Pivot Hinges:

- a. DORMA Door Controls Inc.; Member of The DORMA Group (DC).
- b. Hager Companies (HAG).
- c. Lawrence Brothers, Inc. (LB).
- d. LCN Closers; an Ingersoll-Rand Company (LCN).
- e. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK).
- f. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
- g. Stanley Commercial Hardware; Div. of The Stanley Works (ST).
- h. Or equivalent.

- B. General: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

- C. Hinge Base Metal: Unless otherwise indicated, provide the following:

- 1. Exterior Hinges: 4 ½" X 4 ½" Stainless steel ball bearing, non-removable pin.

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2. Interior Hinges: 4 ½" X 4 ½" Stainless steel ball bearing, with stainless-steel pin.
- D. Non-removable Pins: Provide set screw in hinge barrel that prevents removal of pin while door is closed; for outswinging exterior doors and outswinging corridor doors with locks.
- E. Screws: Phillips flat-head screws; screw heads finished to match surface of hinges.
 1. Metal Doors and Frames: Machine screws (drilled and tapped holes).
 2. Wood Doors and Frames: Wood screws.

2.4 MECHANICAL LOCKS AND LATCHES

- A. Manufacturers:
 1. Adams Rite Manufacturing Co. (ARM).
 2. Architectural Builders Hardware Mfg., Inc. (ABH).
 3. Best Lock Corporation (BLC).
 4. Corbin Russwin Architectural Hardware; Div. of Yale Security Inc. (CR).
 5. Glynn-Johnson; an Ingersoll-Rand Company (GJ).
 6. Hager Companies (HAG).
 7. McKinney Products Company; Div. of ESSEX Industries, Inc. (MCK).
 8. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
 9. Schlage Lock Company; an Ingersoll-Rand Company (S).
 10. Yale Security Inc.; Div. of Williams Holdings (YAL).
 11. or equivalent.
- B. Backset: 2-3/4 inches (70 mm), unless otherwise indicated.

2.5 BOLTS

- A. Flush Bolts: BHMA Grade 1, designed for mortising into door edge.
 1. Manufacturers:
 - a. Adams Rite Manufacturing Co. (ARM).
 - b. Glynn-Johnson; an Ingersoll-Rand Company (GJ).
 - c. Hager Companies (HAG).
 - d. Ives, H. B. (IVS).
 - e. NT Quality Hardware; an Ingersoll-Rand Company (NTQ).
 - f. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
 - g. Yale Security, Inc.; Div. of Willems Holdings (YAL)
 - h. Or equivalent.

2.6 EXIT DEVICES

A. Manufacturers:

1. Adams Rite Manufacturing Co. (ARM).
2. American Device Manufacturing Company; Member of The DORMA Group (ADM).
3. Arrow Architectural Hardware; Div. of ESSEX Industries, Inc. (AAH).
4. Corbin Russwin Architectural Hardware; Div. of Yale Security Inc. (CR).
5. NT Dor-O-Matic Hardware Div.; an Ingersoll-Rand Company (NTD).
6. NT Monarch Hardware; an Ingersoll-Rand Company (NTM).
7. Precision Hardware, Inc. (PH).
8. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
9. Von Duprin; an Ingersoll-Rand Company (VD).
10. Yale Security Inc.; Div. of Williams Holdings (YAL).
11. Or equivalent.

- B. Panic Exit Devices: Listed and labeled for panic protection, based on testing according to UL 305 (Von Duprin 94/95 Series).

2.7 CLOSERS

A. General:

1. All closers shall meet the requirements of the California Building Code Section 1133B.2.5 regarding maximum effort to operate.
 - a. All Doors: 5 pounds maximum pressure to operate.

B. Surface-Mounted Closers:

1. Manufacturers:

- a. Arrow Architectural Hardware; Div. of ESSEX Industries, Inc. (AAH).
- b. Cal-Royal Products, Inc. (CRP).
- c. Corbin Russwin Architectural Hardware; Div. of Yale Security Inc. (CR).
- d. DORMA Door Controls Inc.; Member of The DORMA Group (DC).
- e. LCN Closers; an Ingersoll-Rand Company (L).
- f. Norton Door Controls; Div. of Yale Security Inc. (NDC).
- g. Rixson-Firemark, Inc.; Div. of Yale Security Inc. (RIX).
- h. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
- i. Yale Security Inc.; Div. of Williams Holdings (YAL).
- j. Or equivalent.

2.8 STOPS AND HOLDERS

- A. Stops and Holders: Provide floor stops for doors, unless wall or other type stops are scheduled or indicated. Do not mount floor stops where they will impede traffic. Where floor or wall stops are not appropriate, provide overhead holders.

1. Manufacturers:

- a. Architectural Builders Hardware Mfg., Inc. (ABH).
- b. Baldwin Hardware Corporation (B).
- c. Glynn-Johnson; an Ingersoll-Rand Company (GJ).
- d. Hager Companies (HAG).
- e. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
- f. Triangle Brass Manufacturing Company, Inc. (TBM).
- g. Yale Security Inc.; Div. of Williams Holdings (YAL).
- h. Or equivalent.

- B. Silencers for Door Frames: Neoprene or rubber; fabricated for drilled-in application to frame.

2.9 DOOR GASKETING AND THRESHOLDS

- A. Door Gasketing: Provide continuous weather-strip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated or scheduled. Provide noncorrosive fasteners for exterior applications and elsewhere as indicated.

1. Manufacturers:

a. Gasketing:

- 1) Hager Companies (HAG).
- 2) National Guard Products, Inc. (NGP).
- 3) Pemko Manufacturing Co., Inc. (P).
- 4) Reese Enterprises, Inc. (RE).
- 5) Sealeze Corporation (SEL).
- 6) Ultra Industries; a Macklanburg-Duncan Company (ULT).
- 7) Zero International, Inc. (ZRO).
- 8) Or equivalent.

b. Door Bottoms:

- 1) Hager Companies (HAG).
- 2) National Guard Products, Inc. (NGP).
- 3) Pemko Manufacturing Co., Inc. (PEM).
- 4) Reese Enterprises, Inc. (RE).

- 5) Sealeze Corporation (SEL).
 - 6) Ultra Industries; a Macklanburg-Duncan Company (ULT).
 - 7) Zero International, Inc. (ZRO).
 - 8) Or equivalent.
 2. Air Leakage: Not to exceed 0.50 cfm per foot (0.000774 cu. m/s per m) of crack length for gasketing other than for smoke control, as tested according to ASTM E 283.
 3. Smoke-Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled, based on testing according to UL 1784.
 4. Gasketing Materials: Comply with ASTM D 2000 and AAMA 701/702.
- B. Thresholds: Of type scheduled or indicated.
1. Manufacturers:
 - a. Hager Companies (HAG).
 - b. National Guard Products, Inc. (NGP).
 - c. NT Dor-O-Matic Hardware Div.; an Ingersoll-Rand Company (NTD).
 - d. Pemko Manufacturing Co., Inc. (P).
 - e. Reese Enterprises, Inc. (RE).
 - f. Rixson-Firemark, Inc.; Div. of Yale Security Inc. (RIX).
 - g. Ultra Industries; a Macklanburg-Duncan Company (ULT).
 - h. Zero International, Inc. (ZRO).
 - i. Or equivalent.

2.10 CYLINDERS, KEYING, AND STRIKES

- A. Cylinders: Tumbler type, constructed from brass or bronze, stainless steel, or nickel silver.
1. Manufacturers:
 - a. Same manufacturer as for locks and latches.
 - b. Best Lock Corporation (BLC).
 - c. Corbin Russwin Architectural Hardware; Div. of Yale Security Inc. (CR).
 - d. Sargent Manufacturing Company; Div. of ESSEX Industries, Inc. (SGT).
 - e. Schlage Lock Company; an Ingersoll-Rand Company (S).
 - f. Yale Security Inc.; Div. of Williams Holdings (YAL).
 - g. Or equivalent.
 2. Number of Pins: Seven pins, verify with The District and Owner's Representative.
 3. High-Security Grade: BHMA Grade 1A, listed and labeled as complying with UL 437 (Suffix A).

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4. Permanent Cores: Manufacturer's standard; finish face to match lockset; removable cores.
 5. Construction Master Keys: Provide cylinders with feature that permits voiding of construction keys without cylinder removal. Provide 10 construction master keys.
 6. Construction Cores: Provide construction cores that are replaceable by permanent cores. Provide 10 construction master keys.
 - a. Replace construction cores with permanent cores, as indicated in keying directed by State.
 - b. Furnish permanent cores to State for installation.
- B. Keying System: Factory-registered keying system; grand master key system.
1. Keys: Provide nickel-silver keys permanently inscribed with a visual key control number and "DO NOT DUPLICATE" notation. In addition to one extra blank key for each lock, provide three change keys and five master keys.
- C. Strikes: Manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set.

2.11 FABRICATION

- A. Base Metals: Furnish metals of a quality equal to or greater than that of specified door hardware units and BHMA A156.18 for finishes. Do not furnish manufacturer's standard materials if different from specified standard.
- B. Fasteners: Phillips flat-head screws with finished heads to match surface of door hardware, unless otherwise indicated. Provide steel machine or wood screws or steel through bolts for fire-rated applications.
- C. Spacers or Sex Bolts: For through bolting of hollow metal doors.
- D. Fasteners for Wood Doors: Comply with requirements of DHI WDHS.2, "Recommended Fasteners for Wood Doors."
- E. Finishes: Comply with BHMA A156.18. Unless otherwise indicated the finish shall be BHMA 630 (US 32D – satin stainless steel).

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Examine doors and frames for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

- B. Steel Door and Frame Preparation: Comply with DHI A115 series. Drill and tap doors and frames for surface-applied hardware according to SDI 107.
- C. Wood Door Preparation: Comply with DHI A115-W series.
- D. Mounting Heights: Comply with the following requirements, unless otherwise indicated:
 - 1. Mounting heights shall be as required by the California Building Code, if not the following shall be govern:
 - 2. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
 - 3. Custom Steel Doors and Frames: DHI's "Recommended Locations for Builders' Hardware for Custom Steel Doors and Frames."
 - 4. Wood Doors: DHI WDHS.3, "Recommended Locations for Architectural Hardware for Wood Flush Doors."
 - 5. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section 07920 "Joint Sealants."
- E. Adjust and reinforce attachment substrates as necessary for proper installation and operation. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.
 - 1. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section 07920 "Joint Sealants."
- F. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with accessibility requirements.
 - 1. Door Closers: Adjust sweep period so that from an open position of 70 degrees, the door will take at least three seconds to move to a point 3 inches (75 mm) from the latch, measured to the leading edge of the door.

3.2 DOOR HARDWARE GROUPS

- A. Furnish the following items in the amounts required for a complete and operable facility. Refer to the door schedule on the Drawings for Hardware Group Identification. Each door, or pair of doors within a single opening, has an individual Hardware Group identification.
- B. Refer to descriptions as noted herein before for hardware items not specifically noted by type and manufacturer.
- C. Door Hardware Groups:

Section 08710 Page 10**Door Hardware**

*	Description	Type	Manufacturer
	Group 1 (Restroom)		
1 ½	Pair Butts	FBB 191	(ST)
1	Lockset	L9453 Spada L Concealed Full Face	(S)
1	Kick Plate	# 37	(B)
1	Closer	4211T – 4	(L)
1	Door Stop	#F823X	(B)
1	Threshold	196A	(P)

END OF SECTION 08711

SECTION 10800 TOILET ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Toilet and bath accessories.
2. Underlavatory guards.

1.2 SUBMITTALS

- A. Product Data: For each product indicated.
- B. Product Schedule: Indicating types, quantities, sizes, and installation locations by room of each accessory required.

1.3 WARRANTY

- A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace accessories that develop defects within 2 two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Products: The design for toilet and bath accessories described in Part 2 are based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:
1. Toilet and Bath Accessories:
 - a. American Specialties, Inc.
 - b. Bobrick Washroom Equipment, Inc.
 - c. Bradley Corporation.
 - d. McKinney/Parker Washroom Accessories Corp.
 - e. Or Equivalent.

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Toilet Accessories

2. Underlavatory Guards:

- a. Brocar Products, Inc.
- b. Truebro, Inc.
- c. Or equivalent.

2.2 MATERIALS

- A. Stainless Steel: ASTM A 666, Type 304, No. 4 finish (satin), 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.
- B. Brass: ASTM B 19, ASTM B 16 (ASTM B 16M), or ASTM B 30 castings.
- C. Steel Sheet: ASTM A 366/A 366M, 0.0359-inch (0.9-mm) minimum nominal thickness.
- D. Galvanized Steel Sheet: ASTM A 653/A 653M, G60 (Z180).
- E. Chromium Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).
- F. Baked-Enamel Finish: Factory-applied, gloss-white, baked-acrylic-enamel coating.
- G. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.
- H. Fasteners: Screws, bolts, and other devices of same material as accessory unit, tamper and theft resistant when exposed, and of galvanized steel when concealed.
- I. Keys: Provide universal keys for internal access to accessories for servicing and resupplying. Provide minimum of six keys to Owner's representative.

2.3 TOILET AND BATH ACCESSORIES

- A. Paper Towel Dispenser:
 1. Basis-of-Design Product: Bobrick B-4262.
 2. Lockset: Tumbler type.
- B. Toilet Tissue Dispenser:
 1. Basis-of-Design Product: Bobrick B-4288
- C. Grab Bar:
 1. Basis-of-Design Product: Bobrick B-6806x 42" & 48" with concealed anchors.

2. Material: Stainless steel, 0.05 inch (1.3 mm) thick.
3. Mounting: Concealed.
4. Gripping Surfaces: Slip-resistant texture.
5. Outside Diameter: 1/2 inches for heavy-duty applications.

D. Sanitary Napkin Disposal Unit :

1. Basis-of-Design Product: Bobrick B-270.
2. Material: Stainless steel.
3. Door or Cover: Self-closing.

E. Mirror Unit :

1. Basis-of-Design Product: Bobrick B9436.

F. Underlavatory Guard:

1. Basis-of-Design Product: Brocar.
2. Insulating Piping Coverings: White, antimicrobial, molded-vinyl covering for supply and drain piping assemblies intended for use at accessible lavatories to prevent direct contact with and burns from piping. Provide components as required for applications indicated with flip tops at valves that allow service access without removing coverings.

G. Hand Dryer:

1. Basis-of-Design: Bobrick B-708 115V, 20 amp, 2300 watts.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install accessories using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at heights indicated.
 1. Install grab bars to withstand a downward load of at least 250 lbf (1112 N), when tested according to method in ASTM F 446.
- B. Adjust accessories for unencumbered, smooth operation and verify that mechanisms function properly. Replace damaged or defective items. Remove temporary labels and protective coatings.

END OF SECTION 10800

SECTION 13121
PRE-CAST TOILET BUILDING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. Perform all work relating to a toilet restroom building, including transportation to park site and installation of product.
 - 1. It is the supplier's responsibility to insure that all components will fully comply with the American Disabilities Act.
 - 2. It is the supplier's responsibility to insure that the building meets the requirements of the California Building Code.
 - 3. Manufacturer must provide stamped, engineered drawings prior to acceptance.
- B. System Performance: Provide a complete fully integrated, operational pre-cast concrete modular building, system mutually dependant components that form a pre-cast concrete building capable of withstanding structural and other loads, thermally induced movement, and exposure to weather without failure or infiltration of water into building interior. Manufacturer must coordinate points of connections (POC'S) with the General Contractor.

1.2 RELATED WORK SPECIFIED IN OTHER SECTIONS

- A. Section 10800 -Toilet Accessories

1.3 QUALITY CONTROL

- A. Contractor will provide certification that all concrete contains a minimum of 610 pounds of cement per cubic yard. Cement will be low alkali Type III conforming to ASTM C150.

1.4 NUMBER REQUIRED

- A. California State Parks requires one separate building: A service corridor shall also be required, size sufficient (refer to drawings) for a complete access to plumbing components.

1.5 SUBMITTAL FOR RESTROOM

- A. The submittal shall clearly describe the following and shall comply to Section 01330.

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- B. Supplier's capability to meet specific restroom architectural design criteria and site conditions to meet the California State Parks Accessibility Guidelines, 2009 edition..
- C. Their knowledge of how to design out downstream operating and maintenance costs for a 50-year useful designed life of the facility.
- D. The Supplier's vandal-resistant materials that provide a lower 50-year life cycle cost (as listed hereafter).
- E. Supplier's availability of replacement parts (proprietary and commercial)
- F. Supplier's sample maintenance manual
- G. Designed accessibility for maintenance staff to equip.
- H. Supplier's total experience in restroom facilities and capacity.
- I. Extent of supplier's plant facilities and staff to carry out task.
- J. Design compliance with State of California physically challenged access compliance.
- K. A written schedule time line shall be submitted with bid.

PART 2 – PRODUCTS

2.1 WATERBORNE RESTROOM FACILITY

- A. Design: One restroom building facility is to be provided; minimum number of fixtures will be received as noted below. A service/mechanical room the length or width of the building a minimum of *four feet wide will be required*. Facilities shall be combined into single structure.
 - 1. Toilet Building at Midget Track area:
Unisex, 4 rooms, each room to be accessible and contain 1 water closet and 1 lavatory.

2.2 QUALITY ASSURANCE

- A. Qualifications:
 - 1. Designers: Professional Civil engineer registered in the State of California.
 - 2. Manufacturer:
 - a. At least 5 years experience in prefabricated public restroom design/construction.

- b. Production capacity to provide work required for this Project for completion 120-days from Notice to Proceed.
- B. Regulatory Requirements: Design building system to meet requirements for prefabricated structures in the State of California and shall bear State of California Department of Housing Seal of Compliance.

2.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver and install prefabricated building and attached foundation in undamaged condition to site only when the Contractor and State is ready for installation.
- B. Protect products from damage and deterioration and provide Certificate of Insurance for value of building until accepted by State.

2.4 SPECIAL GUARANTEE

- A. Provide manufacturer's extended guarantee or warranty, with STATE OF CALIFORNIA named as beneficiary, in writing. Special guarantee shall provide for correction, or at the option of the STATE OF CALIFORNIA, removal and replacement of Work specified in the Specification section found *defective* during a minimum period of 5 years.

2.5 BUILDING SYSTEM MANUFACTURERS QUALITATIVE STANDARD

In order to define qualitative standards, products of the following manufacturers, meeting these Specifications, may be used on this Project:

- A. CXT Inc. 3803 N. Sullivan Road, Building 7, Spokane, WA 99216 (800) 696-5766.
- B. Or approved equivalent.
- C. Other manufacturers that may meet the requirements:
 - 1. Weiser Concrete, W3716 US Highway 10, Maiden Rock, WI 54750, (800) 325-8456.
 - 2. Huffcutt Concrete, Inc., 4154 123rd Street, Chippewa Falls, WI 54729, (715) 723-7446.
 - 3. Park and Restroom Structures, Inc. P.O. Box 13280 Spokane Valley, WA 99213, (509) 979-5300.

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2.6 SYSTEM PERFORMANCE

Structural Loading:

- A. Building: Shall be designed for site soils resistance of 1,500 psf maximum to support dead load of building.
- B. Floor Live Load: 50 psf.
- C. Roof Load: 250 psf.
- D. Design Wind Loads: 120 mph
- E. Earthquake Load: In accordance with applicable building code for Seismic Zone 4 for the Project area.

2.7 COMPONENTS

A. Concrete Floor System:

- 1. Manufactured in a closed in environmentally controlled plant. The concrete floor system shall be factory installed attached to building. Floor slab shall be polymer reinforced ultra-high strength concrete with light broom finish. Designed to drain to integral floor drains. Concrete to develop 5,000 psi in 28 days and poured with integral ad mixtures for 98% waterproofing and 89% urine-resistance throughout.
- 2. Footings shall be designed by building manufacturer for installation by General Contractor, on soils of maximum 1,500-psf resistance.

B. Concrete:

- 1. The concrete mix will be designed to ACI 211.1. Concrete will contain a minimum of 610 pounds of cement per cubic yard.
- 2. Coarse aggregates used in concrete mix design to conform to ASTM C33.
- 3. Minimum water cement ratio not to exceed .45, slump not to exceed 4".

C. Colored Concrete:

- 1. Color additives to conform to ASTM C 979 (integral colored concrete). Provide samples for approval (25 standard colors).
- 2. The following will contain colored concrete:
 - a. Roof panels.
 - b. Wall panels.
 - c. Screen walls.

- D. Reinforcement: To meet the criteria listed under specification Section 03300, in addition to the following:
1. All reinforcement will be new, free of dirt, oil, paint, grease, loose mill scale and loose or thick rust when placed.
 2. Steel reinforcement will be centered in the cross-sectional area of the walls and will have at least 1" of cover on the under surface of the floor and roof.
 3. The maximum allowable variation for center-center spacing of reinforcing steel will be $\frac{1}{2}$ ".
 4. Full lengths of reinforcing steel will be used when possible. When splices are necessary on long runs, splices will be alternated from opposite sides of the components for adjacent steel bars. Lap bars larger than a # 4 a minimum of 24 bar diameters.
 5. Reinforcing bars will be bent cold. No bars partially embedded in concrete will be field bent unless approved by the States Representative.
- E. Sealers: Weather proofing sealer for exterior of building will be clear water repellant penetrating sealer. Product duration shall be minimum 5 years.
- F. Caulking, Grout, Adhesive and Sealer
1. All caulking will remain flexible and no-sag at temperatures from – 40 to +140 degrees Fahrenheit.
 2. Interior joints will be caulked with a paintable polyurethane sealant.
 3. Exterior joints will be caulked with a tripolymer sealant caulk which compliments the exterior color.
 4. Grout will be a non-shrink type and will be painted to match the color of surrounding concrete as nearly as possible.
 5. Epoxy concrete adhesive will be two component, rigid, non-sag gel adhesive for bonding to dry or damp surfaces, moisture intensive.
 6. Cement base coating is formulated with a very fine aggregate system and a built in bonding agent.
- G. Paint
1. All paints and materials will conform to all Federal specifications or be similar "top-of-the-line-Components." Paints will not contain more than .06 percent by weight of lead.
 2. Type of paints for toilets:
 - a. Inside concrete surfaces:
 - I. Interior floors will be a 2-component, catalyzed, water borne polyamide epoxy with a micronized polymer additive to provide uniform slip resistant texture. The color will be gray.

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- II. Interior walls and ceilings will be a modified acrylic, water repellant penetrating stain. The color will be white.
 - b. Metal surfaces both inside and out:
 - I. DTM ALKYD
 - c. Exterior concrete surfaces:
 - I. Exterior slab will be clear sealer
 - II. Exterior walls and roof will be a water repellant penetrating stain in the same color as the walls or roof followed by a clear acrylic anti-graffiti sealer.
- H. Grab bars: Grab bars will be 18 gauge, type 304 stainless steel with 1-1/2" clearance. Grab bars will each be able to withstand 300 pound top loading.
- I. Structural Frame consisting of concrete walls and roof shall have a 5,000 PSI at 28 days.
- J. General Interior Design: Construct interior for hosedown maintenance, corrosion resistance, vandal resistance, fire and smoke resistance, ease of graffiti removal, and maintenance reduction.
- K. Doors and Frames (See Section 08710 Door Hardware for Requirements):
 - 1. Doors: 16 gauge hollow metal, foam filled steel doors hung on continuous gear, non-lubricating hinges, with LCN-heavy duty door closer, fitted with custom fabricated four-screw 3" fastener, stainless steel. Door sweep to be provided at bottom of door and be adjustable brush type.
 - 2. Signage: Comply with California Title 24 requirements.
 - 3. Guarantee: Manufacturer shall unconditionally guarantee its door for 10 years against failures due to corrosion if the specific environment is named at the time of purchase.
 - 4. Locksets: All doors are to have locks of a type, which are openable at all times from the inside, by merely turning the lever and shall not require special knowledge or effort, unless otherwise specifically noted.
 - a. Both handles will operate door lock except when locked by interior push button. Push button will automatically release when interior handle is turned.
 - b. Design: Schlage L Series cylinder locksets/latchsets. See schedule below for function required.
 - c. Lever: Schlage L Series Spada.
 - d. Cylinder: Schlage 6 Pin.
 - e. Construction: All exterior door lockset and latchset components shall be US26D finish.

- f. All hardware components to be reviewed by Prairie City SVRA District Staff, prior to order and installation.

L. Mechanical/Plumbing:

1. Ventilation: Wall vent to be cast in concrete wall. Unit frame to be C3x4.1 channel steel. The louver to be inverted Y. All steel to be primed prior to installation into concrete form. Apply second coat of prime paint after concrete forms are remolded. Install insect galvanized steel screen that is attached to louver. Provide 2 - 12"x12" vents per restroom space, minimum.
2. Water Supply: Below grade to be Type L copper sleeved in Schedule 40 PVC. Above grade to be Type L copper. Provide gate valve at water line inlet. Main supply to have wye strainer, water pressure gauge, and a separate drainage vent system for each toilet and shower compartment, using only gravity and valving for winterization. Supply in each compartment shall be capable of isolation. Provide freeze protection to maintain above 35 degrees F at all times.
3. Waste System: Schedule 40 PVC waste and vents, except above roof which shall be cast iron.
4. All plumbing to be concealed in the service area.
5. Toilet will be constructed of vitreous china, wall hung, with siphon jet action. Toilet will have a back spud for a concealed flush valve connection and will be mounted with the top of the seat 17 inches above the finished floor. Seat will be heavy duty solid plastic with an open front.
6. Flush valve will be concealed closet flush-o-meter constructed of rough brass. Furnish valve with integral vacuum breaker and wall mounted push button. Valve will be of a water saver type with a flow of 1.6 gallons per flush.
7. Lavatory will be cast iron with back splashguard, front overflow opening, equipped with brass trap and drain pipe without stopper. Sink will be 20 inches wide x 18 inches front to back x 6 inches deep.
8. Water valve will be self-closing water set with indexed push button.
9. Hose bib to be provided in the chase area.
10. A main shut-off valve and drain to be provided with plumbing.
11. Testing: Test in accordance with governing agency.

M. Miscellaneous Hardware:

1. Closers:
 - a. Provide LCN Model #4010 – EDA-SR1-ALXTB at each restroom doors.
 - b. Opening pressure at handicap doors: 5 pounds pressure.

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- c. Permit door to open 180 degrees maximum, or as far as conditions allow. Provide with key-type regulating screws and back check.
 - d. Finish hardware schedule submittal shall indicate parallel or regular arm installation for acceptance.
 - e. Through-bolting where attached to door.
 - 2. Door Stop: Doorstop to have cast metal base, US26D finish with gray rubber 2 ¼" diameter x 1" projection minimum bumper.
 - 3. Kick Plate: 18-gauge, 12-inches high by width of door minus jambs. Stainless steel edges shall be beveled. Both sides of doors
- N. Finish:
- 1. Unless otherwise indicated, the finish of all hardware shall be BHMA 630 (US 26D).
 - 2. Closers: Lacquer finished to match adjacent door hardware.
 - 3. Brushed chrome over cast metals.
 - a. Keying – Final Key System: Key system shall match the existing facility and shall be master keyed to match the existing facilities at the park unit.
- O. Maintenance-Related Items: Furnish 1 set of installation and adjusting tools and 1 set of maintenance manuals for locksets, exit devices, door controls/closers, and hinges to the State's Representative in charge of maintenance.
- P. Electrical:
- 1. Cable: THWN-THHN Insulation to California Electrical Code (CEC).
 - 2. Conduit: EMT for interior and schedule 40 PVC for underground. All wiring to be in conduit.
 - 3. Panel: Minimum 150 amp main with 24 spaces, Nema Type 3, lockable. To be located in the Chase portion of the building.
 - 4. Chase Outlet: GFCI Receptacles: Straight blade, non-feed-through type, heavy-duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch deep outlet box without an adapter.
 - 5. Switches: Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20.
 - 6. Wall Plates: Single and combination types to match corresponding wiring devices.
 - a. Plate-Securing Screws: Metal with head color to match plate finish.
 - b. Material for Finished Spaces: Smooth, high-impact thermoplastic Material for Unfinished Spaces: Galvanized steel Smooth

7. Lighting:
 - a. Outside: 35W high pressure sodium, cast aluminum case, rated for outdoor use, vandal proof. Photocell controlled.
 - b. Inside: 2 times a 13W fluorescent, vandal proof.
 - c. Pipe Chase: Two each 32 W fluorescent, suspended,
8. Photo Electric System
 - a. Provide a complete photo electric system to provide a timed switchable light in each room of the structure.
9. The hand dryer will be an air compression type with remote motor unit. Push button switch located in cast nozzle housing with flexible hose connecting blower motor, housing and nozzle. Power input 120 VAC, 7A (non-heated air).

2.8 CONCRETE MIX DESIGN

- A. Concrete: The concrete shall have a minimum 28-day compressive strength of 5,000 psi.
- B. Aggregate: Aggregate used in concrete mix will conform to ASTM C33.
- C. Water: Water used for washing, mixing, and curing shall be free from oil, salts, and other impurities, which would affect the quality of the concrete.
- D. Colored Concrete:
 1. Color additives will conform to ASTM C979. A color sample will be made available for approval by State's Representative.
 2. All roof panels, building walls, and screen panels will contain colored concrete.
- E. Temperature:
 1. Concrete will not be poured if ambient temperature is 35 degrees F or expected to drop below that temperature during the curing process.
 2. Frozen or frost containing material will not be used.
 3. The temperature of concrete will not exceed 80 degrees F at the time of placement and will be covered when ambient temperatures reach 90 degrees F.
- F. Reinforcing:
 1. All reinforcing will be new and free of dust, oil, paint, grease, and loose rust scale when placed.
 2. Deformed billet-steel bars conforming to ASTM A165-80, Grade 60 free from all non-metallic coatings. Rust is acceptable provided minimum dimensions meet specifications.
 3. Welded wire mesh electrically welded will conform to ASTM A185.

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4. Bends will be 6 times the diameter of the bar dimension.

G. Miscellaneous Steel:

1. All steel excluding rebar will be monel grade stainless steel joined by stainless steel welds as used in a corrosive environment or an alternative fastening method acceptable for a corrosive environment and approved by the State's Representative.
2. All plates used for structural connection will comply with No. 1 above and will be embedded a minimum of 2 inches in concrete.

H. Curing Compound: Curing shall comply with Section 90-7.1A of the Standard Specifications.

I. Testing: The following tests will be performed on concrete used in the manufacture of toilets. All testing will be performed in laboratories. Testing will only be performed by qualified individuals who have been certified ACI Technician Grade 1. Sampling will be in accordance with ASTM C172.

1. The slump of the concrete will be performed on the first batch of concrete in accordance with ASTM C143. This slump will be in the 3-inch – 4-inch range.
2. The air content of the concrete will be checked per ASTM C231 on the first batch of concrete. The air content will be in the range of 4.5 percent +/-1.75 percent.
3. The compressive strength of the cylinders will be tested to ASTM C39. We will make 2 cylinders for release and 3 cylinders for 28-day strength. The minimum strength will be 5,000 at 28 days and the minimum release strength will be 3,000 psi.
4. A copy of all test reports will be provided to the state representative as soon as 28-day test results are available.

2.9 FINISHES

A. Paint:

1. Interior concrete walls and ceilings will be painted with 3 coats of 2-part water based epoxy.
2. Metal surfaces will be painted with primer and 2 coats epoxy based paint.
3. Exterior will be painted with 2 coats clear acrylic sealer.

B. Paint Application:

1. An appropriate curing time will be allowed before paint is applied to concrete. Efflorescence on the final surface will not be acceptable.

2. Some applications may require acid etching. A 30% solution of hydrochloric acid will be used, flushed with water and allowed to thoroughly air dry.
3. Painting shall not be done outside in cold, frosty or damp weather.
4. Painting shall not be done outside in winter unless the temperature is 50 degrees F. or higher.
5. Painting shall not be done in dusty areas.
6. Schedule of finishes:
 - a. Inside concrete surfaces:
 - I. Inside floors will be 1 coat of 1-part water based epoxy with a silica sand suspension to provide uniform texture.
 - II. Interior walls and ceilings will be 2 coats of a modified acrylic, water repellant penetrating stain, followed by 1 coat of clear sealer.
 - b. Metal surfaces both inside and out:
 - I. 2 coats of DTM ALKYD.
 - c. Exterior concrete surfaces:
 - I. Exterior slab will be 1 coat of clear sealer.
 - II. Exterior walls will be 2 coats of water repellant penetrating stain in the same color of the walls or roof followed by 1 coat of clear acrylic anti-graffiti sealer.

C. Caulking, Adhesive, and Sealer:

1. Caulking will remain flexible and not sag at temperatures between 50 degrees to 140 degrees F.
2. Caulking will be paintable siliconized acrylic caulk matching color of concrete.

2.10 MISCELLANEOUS

- A. Interior Grab Bars: Grab bars will be 18-gauge stainless steel with 1-1/2-inch clearance from walls and able to withstand 300 pounds top loading.

2.11 UTILITY CONNECTIONS

- A. Provide utility connection to a provided connection point within at Building Pad, Supplier of pre-cast Building to coordinate location with the General Contractor. Utilities shall consist of one connection for two 2" electrical conduits, one 4" sewer, and one 2" water. All shall be underground with a minimum 30 inches of cover.
- B. Provide two 2" empty conduit from chaseway to exterior of Building (5 feet beyond building slab cap and plug).

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PART 3 - EXECUTION

3.1 PRODUCING AND MIXING

- A. Cement, water, aggregate, and sand shall be stored, proportioned, mixed, transported, and placed in conformance with "Recognized Standards of Good Practice" of the ACI which will result in concrete that is thoroughly and uniformly mixed, that is suitable for the use intended, and which conforms to requirements specified herein .
- B. Concrete shall be placed within thirty minutes of mixing.

3.2 REINFORCING

- A. Reinforcement shall be placed and secured in center of forms. Reinforcing shall be covered with a minimum of 2 inches of concrete.

3.3 CONSOLIDATING

- A. Concrete will be consolidated by use of a mechanical vibrator until sufficiently compacted so that no segregation occurs.

3.4 FINISHING

- A. Concrete will be furnished and troweled until all marks are removed.
- B. Interior floors and exterior slabs will receive a light broom finish, which will allow water to drain out of the building.
- C. Exterior screen and building walls will be a split face block texture. Color to be selected by State Parks.
- D. All exterior roof panel subsurfaces will receive a simulated metal roof standing seam finish. Underside of roof panel will be smooth panel. Color to be selected by State Parks.

3.5 CRACKS AND PATCHING

- A. Cracks in concrete components, which are judged to affect the structural integrity of the building, will be rejected on site by State Representative.
- B. Cracks judged to be acceptable, small holes, depressions, and air voids will be patched with a suitable material that will match color, finish, and texture of the surrounding surface and will keep salt air from reaching reinforcement within concrete.
- C. Patches will not be allowed on defective areas if the structural integrity of the building is affected.

3.6 CURING AND HARDENING CONCRETE

- A. Concrete surfaces will not be allowed to dry from exposure to hot dry weather during initial curing period.
- B. Curing compounds will not be used on interior walls of the vault.

3.7 INSTALLATION

- A. Scope of Work: Work specified under this section includes placement of precast concrete vaults and buildings.
- B. Location: It is the responsibility of the State to:
 - 1. General Contractor to provide exact location by stakes or other approved method.
 - 2. Provide site free of overhead and/or underground obstructions.
 - 3. Provide access to the site for truck delivery.
- C. Excavation and Elevation: Finish and floor elevation will be 4-6 inches above natural grade measured at the front (entrance) of the exterior slab unless otherwise approved by the State Representative. The Contractor will install buildings at these sites with the floor elevation within plus or minus 0.05 feet of the specified elevation.
- D. Backfill and Compaction: Contractor will set building in place. Contractor will place utilities (water, sewer, and electrical) from building to utility box 5 feet from building edge.
- E. Toilet Riser and Accessories: Silicone caulk will be applied between toilet riser flange and concrete floor before the toilet riser is installed.
- F. Exhaust Pipe Installation: After exhaust pipe is installed, seal around pipe at top and underside of roof with silicone caulk. Seal around pipe at top of slab will be accomplished by using backer rod and silicone caulk.

END OF SECTION 13121

SECTION 13127 ALUMINUM BLEACHERS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes complete exterior aluminum bleachers sections with accessible seating locations.
 - 1. 5 row X 15 feet bleacher section.
 - 2. 5 row X 21 feet bleacher section
 - 3. 5 row X 27 feet bleacher section.
 - 4. Others as noted in plans not necessarily listed here.
- B. See Division 3 Section 03300 "Cast-in-Place Concrete" for concrete foundations and anchor-bolt installation.

1.2 DESIGN PERFORMANCE REQUIREMENTS

- A. General: Provide a complete, integrated set of aluminum bleacher system that form a bleacher system capable of withstanding structural and other loads, Include primary and secondary framing, seating, steps, and accessories complying with requirements indicated.
- B. Design: The design and construction shall be in accordance with the 2001 edition of California Building Code (or latest edition). Local building regulations and the ADA. Specific loads to be:
 - 1. Wind: Minimum 90 mph basic wind speed, exposure importance one.
 - 2. Seismic loading: Minimum zone 4, important factor 1.
 - 3. Liveload of Seat and Floor Plank: 120 PLF
 - 4. Liveload: 100psf of gross horizontal program.
 - 5. Lateral sway load, seat plank: 24 PLF
 - 6. Perpendicular sway load, seat plank: 10 PLF.
 - 7. Individual frame sections shall be of 100 percent welded construction. Lateral bracing, ties and railposts and other incidental members shall be bolted connections.

1.3 QUALIFICATIONS

- A. Manufacturer's qualifications: Manufacturer must have 10 years experience in the fabrication and installation of bleachers. Welders must be AWS certified.

1.4 SUBMITTALS

- A. Product Data: For each type of aluminum stair section. Manufacturer's complete installation guidelines and procedures.

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Aluminum Bleachers

- B. Shop Drawings: Include plans, elevations, sections, details, and misc. attachments.
 - 1. Include structural analysis data signed by a qualified Professional Engineer in the State of California.
 - 2. Anchor Bolt Plans: Include location diameter and projection of anchor bolts requires to the exterior concrete slab.
 - 3. Manufacturer's Installation procedures.
- C. Manufacturer's Certificate.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect products from damage in original containers until time of installation.

1.6 COORDINATION

- A. Coordinate size and location of concrete slab and casting of anchor-bolt inserts into the slab.

1.7 WARRANTY

- A. The manufacturer shall provide owner with a written warranty that guarantees the bleachers for not less than five years against defective materials, fasteners, workmanship or welding with provisions that any manufactures part that wears out or proves to be defective will be replaced at no additional cost to The Owner. Damage resulting from vandalism, misuse and acts of God expected.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturer's: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- 1. Aluminum Seating, Inc. San Bernardino, CA 92413 (909) 884-9449
- 2. LA Steelcraft Pasadena, CA 91109 (626) 798-7401
- 3. Outdoor Aluminum Geneva, AK 36340 (800) 225-4249
- 4. Or equivalent.

2.2 MATERIALS

- A. Extruded Aluminum: 6061 and 6063 alloy, 16 temper.
- B. Fasteners: Cadmium or zinc chromate plate steel.
- C. Hold Down Clip Assembly: Aluminum alloy 6063-T6.

- D. Seat Boards: Nominal 2" X 10", wall thickness 0.093 anodized aluminum plank 6063-T6.
- E. Foot Boards: 2 nominal 2" X 10", wall thickness 0.093 mill finish aluminum plank 6063-T6.
- F. Risers: Nominal 1" X 6" mill finish plank 6063-T6.
- G. End Caps: plank and riser end caps- extruded aluminum, wall thickness 0.090 60603-T6.
- H. Splices: All plank splices shall be made over a supporting frame not less than 2" wide, dual sleeve inserts of extruded 6063-T6 aluminum channels 18" in length.
- I. Understructure:
 - 1. Vertical members: 2" X 2" square tube 6061-T6.
 - 2. Horizontal board supports: 2" X 2" X 01.87 angle 6061-T6.
 - 3. Base sill angle: 2" X 3" X 0.1.88 angle 6063-T6.
 - 4. Diagonal horizontal and "X" braces : 1.50" X 1.50" X 0.125 angle 6061-T6.

2.3 FABRICATION

- A. Fabrication and assembly of bleachers as per the manufacturer's standards and instructions.

PART 3- EXECUTION

3.1 ERECTION

- A. Before installation begins, survey elevations and locations of concrete and anchor bolts, and notify General Contractor if any corrections need to be made.
- B. Installation shall be in accordance with Manufacturer's installation procedures.

END OF SECTION 13127

SECTION 15050
BASIC MECHANICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Piping materials and installation instructions common to most piping systems.
 - 2. Dielectric fittings.
 - 3. Sleeves.
 - 4. Escutcheons.
 - 5. Grout.

1.2 DEFINITIONS

- A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms.
- B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
- C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
- D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants.
- E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures.

1.3 QUALITY ASSURANCE

- A. Electrical Characteristics for Mechanical Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

Basic Mechanical Materials and Methods

- A. Refer to individual Division 15 piping Sections for pipe, tube, and fitting materials and joining methods.
- B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

- A. Refer to individual Division 15 piping Sections for special joining materials not listed below.
- B. Pipe-Flange Gasket Materials: ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch maximum thickness unless thickness or specific material is indicated.
- C. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.
- D. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.
- E. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.
- F. Welding Filler Metals: Comply with AWS D10.12.
- G. Solvent Cements for Joining Plastic Piping:
 - 1. ABS Piping: ASTM D 2235.
 - 2. CPVC Piping: ASTM F 493.
 - 3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.
 - 4. PVC to ABS Piping Transition: ASTM D 3138.

2.3 DIELECTRIC FITTINGS

- A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.
- B. Insulating Material: Suitable for system fluid, pressure, and temperature.
- C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig minimum working pressure at 180 deg F.
- D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure as required to suit system pressures.
- E. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

- F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

2.4 SLEEVES

- A. Galvanized-Steel Sheet: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.
- B. Steel Pipe: ASTM A 53, Type E, Grade B, Schedule 40, galvanized, plain ends.
- C. Cast Iron: Cast or fabricated "wall pipe" equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop, unless otherwise indicated.
- D. Stack Sleeve Fittings: Manufactured, cast-iron sleeve with integral clamping flange. Include clamping ring and bolts and nuts for membrane flashing.
 - 1. Underdeck Clamp: Clamping ring with set screws.
- E. Molded PVC: Permanent, with nailing flange for attaching to wooden forms.
- F. PVC Pipe: ASTM D 1785, Schedule 40.
- G. Molded PE: Reusable, PE, tapered-cup shaped, and smooth-outer surface with nailing flange for attaching to wooden forms.

2.5 ESCUTCHEONS

- A. Description: Manufactured wall and ceiling escutcheons and floor plates, with an ID to closely fit around pipe, tube, and insulation of insulated piping and an OD that completely covers opening.
- B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with polished chrome-plated finish.
- C. One-Piece, Cast-Brass Type: With set screw.
 - 1. Finish: Polished chrome-plated and rough brass.
- D. Split-Casting, Cast-Brass Type: With concealed hinge and set screw.
 - 1. Finish: Polished chrome-plated and rough brass.

2.6 GROUT

- A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

Basic Mechanical Materials and Methods

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

PART 3 - EXECUTION

3.1 PIPING SYSTEMS - COMMON REQUIREMENTS

- A. Install piping according to the following requirements and Division 15 Sections specifying piping systems.
- B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.
- C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.
- D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Select system components with pressure rating equal to or greater than system operating pressure.
- K. Install escutcheons for penetrations of walls, ceilings, and floors.
- L. Install sleeves for pipes passing through concrete and masonry walls, and concrete floor and roof slabs.
- M. Aboveground, Exterior-Wall Pipe Penetrations: Seal penetrations using sleeves and mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
 1. Install steel pipe for sleeves smaller than 6 inches in diameter.

2. Install cast-iron "wall pipes" for sleeves 6 inches and larger in diameter.
 3. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- N. Underground, Exterior-Wall Pipe Penetrations: Install cast-iron "wall pipes" for sleeves. Seal pipe penetrations using mechanical sleeve seals. Select sleeve size to allow for 1-inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.
1. Mechanical Sleeve Seal Installation: Select type and number of sealing elements required for pipe material and size. Position pipe in center of sleeve. Assemble mechanical sleeve seals and install in annular space between pipe and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make watertight seal.
- O. Verify final equipment locations for roughing-in.
- P. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.
- 3.2 PIPING JOINT CONSTRUCTION
- A. Join pipe and fittings according to the following requirements and Division 15 Sections specifying piping systems.
 - B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
 - C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.
 - D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.
 - E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.
 - F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:

Basic Mechanical Materials and Methods

1. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified.
 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.
- G. Flanged Joints: Select appropriate gasket material, size, type, and thickness for service application. Install gasket concentrically positioned. Use suitable lubricants on bolt threads.
- H. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
1. Comply with ASTM F 402, for safe-handling practice of cleaners, primers, and solvent cements.
 2. ABS Piping: Join according to ASTM D 2235 and ASTM D 2661 Appendixes.
 3. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.
 4. PVC Pressure Piping: Join schedule number ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 5. PVC Nonpressure Piping: Join according to ASTM D 2855.
 6. PVC to ABS Nonpressure Transition Fittings: Join according to ASTM D 3138 Appendix.

3.3 PIPING CONNECTIONS

- A. Make connections according to the following, unless otherwise indicated:
1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
 2. Install flanges, in piping NPS 2-1/2 and larger, adjacent to flanged valves and at final connection to each piece of equipment.
 3. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.4 GROUTING

- A. Clean surfaces that will come into contact with grout.
- B. Provide forms as required for placement of grout.
- C. Avoid air entrapment during placement of grout.
- D. Place grout around anchors.
- E. Cure placed grout.

END OF SECTION 15050

SECTION 15060 HANGERS AND SUPPORTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes hangers and supports for mechanical system piping and equipment.

1.2 PERFORMANCE REQUIREMENTS

- A. Design channel support systems for piping to support multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

1.3 SUBMITTALS

- A. Product Data: For each type of pipe hanger, channel support system component, and thermal-hanger shield insert indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. 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.

2.2 MANUFACTURED UNITS

- A. Pipe Hangers, Supports, and Components: MSS SP-58, factory-fabricated components.
 - 1. Manufacturers:
 - a. B-Line Systems, Inc.
 - b. Globe Pipe Hanger Products, Inc.
 - c. Grinnell Corp.
 - d. GS Metals Corp.
 - e. National Pipe Hanger Corp.
 - 2. Galvanized, Metallic Coatings: For piping and equipment that will not have field-applied finish.

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Hangers and Supports

3. Nonmetallic Coatings: On attachments for electrolytic protection where attachments are in direct contact with copper tubing.
- B. Channel Support Systems: MFMA-2, factory-fabricated components for field assembly.
 1. Manufacturers:
 - a. B-Line Systems, Inc.
 - b. Grinnell Corp.
 - c. GS Metals Corp.
 - d. National Pipe Hanger Corp.
 - e. Unistrut Corp.
 2. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.
 3. Nonmetallic Coatings: On attachments for electrolytic protection where attachments are in direct contact with copper tubing.

2.3 MISCELLANEOUS MATERIALS

- A. Powder-Actuated Drive-Pin Fasteners: Powder-actuated-type, drive-pin attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.
- B. Mechanical-Anchor Fasteners: Insert-type attachments with pull-out and shear capacities appropriate for supported loads and building materials where used.
- C. Grout: ASTM C 1107, Grade B, factory-mixed and -packaged, nonshrink and nonmetallic, dry, hydraulic-cement grout.
 1. Characteristics: Post hardening and volume adjusting; recommended for both interior and exterior applications.
 2. Properties: Nonstaining, noncorrosive, and nongaseous.
 3. Design Mix: 5000-psi , 28-day compressive strength.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Specific hanger requirements are specified in Sections specifying equipment and systems.
- B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Specification Sections.

3.2 INSTALLATION

- A. Pipe Hanger and Support Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Channel Support System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled channel systems. Field assemble and install according to manufacturer's written instructions.
- C. Install building attachments within concrete slabs. Space attachments within maximum piping span length indicated in MSS SP-69. Install additional attachments at concentrated loads, including valves, flanges, guides, strainers, and expansion joints, and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.
- D. Install powder-actuated drive-pin fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual.
- E. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
- F. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- G. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- H. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- I. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.9, "Building Services Piping," is not exceeded.

3.3 ADJUSTING

- A. Hanger Adjustment: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

3.4 PAINTING

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Hangers and Supports

- A. Touching Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils. See Division 9, Section 09910 "Painting" for paint materials and application requirements.
- B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 15060

SECTION 15110 VALVES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following general-duty valves:
 - 1. Copper-alloy ball valves.
 - 2. Bronze gate valves.
- B. See Division 2 piping Sections for general-duty and specialty valves for site construction piping.
- C. See Division 15 piping Sections for specialty valves applicable to those Sections only.

1.2 SUBMITTALS

- A. Product Data: For each type of valve indicated. Include body, seating, and trim materials; valve design; pressure and temperature classifications; end connections; arrangement; dimensions; and required clearances. Include list indicating valve and its application. Include rated capacities; furnished specialties; and accessories.

1.3 QUALITY ASSURANCE

- A. ASME Compliance: ASME B31.9 for building services piping valves.
 - 1. Exceptions: Domestic hot- and cold-water piping valves unless referenced.
- B. NSF Compliance: NSF 61 for valve materials for potable-water service.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. 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.

2.2 VALVES, GENERAL

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Valves

- A. Refer to Part 3 "Valve Applications" **Article** for applications of valves.
- B. Bronze Valves: NPS 2 and Smaller: Threaded ends, unless otherwise indicated.
- C. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.
- D. Valve Sizes: Same as upstream pipe, unless otherwise indicated.
- E. Valve Actuators:
 - 1. Handwheel: For valves other than quarter-turn types.
 - 2. Lever Handle: For quarter-turn valves NPS 6 and smaller, except plug valves.
- F. Valve Flanges: ASME B16.24 for bronze valves.
- G. Valve Grooved Ends: AWWA C606.
 - 1. Solder Joint: With sockets according to ASME B16.18.
 - a. Caution: Use solder with melting point below 840 deg F for angle, check, gate, and globe valves; below 421 deg F for ball valves.
 - 2. Threaded: With threads according to ASME B1.20.1.
- H. Valve Bypass and Drain Connections: MSS SP-45.

2.3 COPPER-ALLOY BALL VALVES

- A. Manufacturers:
 - 1. Copper-Alloy Ball Valves:
 - a. American Valve, Inc.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Grinnell Corporation.
 - d. NIBCO INC.
 - e. Watts Industries, Inc.; Water Products Div.
- B. Copper-Alloy Ball Valves, General: MSS SP-110.
- C. Copper-Alloy Ball Valves: Brass or bronze body with chrome-plated bronze ball, PTFE or TFE seats, and 400-psig minimum CWP rating.

2.4 BRONZE GATE VALVES

- A. Manufacturers:

1. Type 1, Bronze, Nonrising-Stem Gate Valves:
 - a. American Valve, Inc.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Grinnell Corporation.
 - d. NIBCO INC.
 - e. Red-White Valve Corp.
 - f. Watts Industries, Inc.; Water Products Div.
 2. Type 2, Bronze, Rising-Stem, Solid-Wedge Gate Valves:
 - a. American Valve, Inc.
 - b. Crane Co.; Crane Valve Group; Jenkins Valves.
 - c. Grinnell Corporation.
 - d. NIBCO INC.
 - e. Red-White Valve Corp.
- B. Bronze Gate Valves, General: MSS SP-80, with ferrous-alloy handwheel.
- C. Type 1, Class 125, Bronze Gate Valves: Bronze body with nonrising stem and bronze solid wedge.
- D. Type 2, Class 125, Bronze Gate Valves: Bronze body with rising stem and bronze solid wedge.

PART 3 - EXECUTION

3.1 VALVE APPLICATIONS

- A. Refer to piping Sections for specific valve applications. If valve applications are not indicated, use the following:
1. Shutoff Service: Ball valves.
- B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP class or CWP ratings may be substituted.
- C. Domestic Water Piping: Use the following types of valves:
1. Ball Valves, NPS 2 and Smaller: Two-piece, 400-psig CWP rating, copper alloy.
 2. Gate Valves, NPS 2 and Smaller: Type 1 and 2, Class 125, bronze.

3.2 VALVE INSTALLATION

- A. Piping installation requirements are specified in other Division 15 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

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Valves

- B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.
- C. Locate valves for easy access and provide separate support where necessary.
- D. Install valves in horizontal piping with stem at or above center of pipe.
- E. Install valves in position to allow full stem movement.

3.3 JOINT CONSTRUCTION

- A. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Grooved Joints: Assemble joints with keyed coupling housing, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.
- C. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.4 ADJUSTING

- A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

END OF SECTION 15110

SECTION 15140 DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes domestic water piping from locations indicated to fixtures and equipment inside the building.

1.2 SUBMITTALS

- A. Water Samples: Specified in "Cleaning" Article in Part 3.

1.3 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 61, "Drinking Water System Components-Health Effects; Sections 1 through 9," for potable domestic water piping and components.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Transition Couplings: Coupling or other manufactured fitting the same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- B. Hard Copper Tube: ASTM B 88, Type K, water tube, drawn temper.
 - 1. Copper Pressure Fittings: ASME B16.18, cast-copper-alloy or ASME B16.22, wrought- copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.
 - 2. Bronze Flanges: ASME B16.24, Class 150, with solder-joint end. Furnish Class 300 flanges if required to match piping.
 - 3. Copper Unions: MSS SP-123, cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.

2.2 VALVES

- A. Refer to Division 15 Section 15110 "Valves" for copper, bronze and brass, general-duty valves.

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Domestic Water Piping

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping rating may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground piping, unless otherwise indicated.
- C. Domestic Water Piping: Use the following piping materials for each size range:
 - 1. NPS 1-1/2 and Smaller: Hard copper tube, Type K; copper pressure fittings; and soldered joints.
 - 2. NPS 2: Hard copper tube, Type K; copper pressure fittings; and soldered joints.

3.2 VALVE APPLICATIONS

- A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:
 - 1. Shutoff Duty: Use bronze ball or gate valves for piping NPS 2 and smaller.
 - 2. Throttling Duty: Use bronze ball or globe valves for piping NPS 2 and smaller.
 - 3. Drain Duty: Hose-end drain valves.

3.3 PIPING INSTALLATION

- A. Refer to Division 2 Section 02510 "Water Distribution" for site water distribution and service piping.
- B. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for basic piping installation.
- C. Extend domestic water service piping to exterior water distribution piping in sizes and locations indicated.
- D. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for sleeves and mechanical sleeve seals.
- E. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for wall penetration systems.

- F. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside building at each domestic water service. Refer to Division 15 Section 15430 "Plumbing Specialties" for drain valves and strainers.
- G. Install water-pressure regulators downstream from shutoff valves. Refer to Division 15 Section 15430 "Plumbing Specialties" for water-pressure regulators.
- H. Install domestic water piping level with 0.25 percent slope downward toward drain and plumb.
- I. Fill water piping. Check components to determine that they are not air bound and that piping is full of water.
- J. Perform the following steps before operation:
 - 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open shutoff valves to fully open position.
 - 3. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
 - 4. Remove and clean strainer screens. Close drain valves and replace drain plugs.
- K. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.
- L. Check plumbing specialties and verify proper settings, adjustments, and operation.
 - 1. Water-Pressure Regulators: Set outlet pressure at 80 psig maximum, unless otherwise indicated.

3.4 JOINT CONSTRUCTION

- A. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure, unless otherwise indicated.

3.5 VALVE INSTALLATION

- A. Install sectional valve close to water main on each branch and riser serving plumbing fixtures or equipment. Use ball or gate valves for piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.
- B. Install shutoff valve on each water supply to equipment and on each water supply to plumbing fixtures without supply stops. Use ball or gate valves for

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Domestic Water Piping

piping NPS 2 and smaller. Use butterfly or gate valves for piping NPS 2-1/2 and larger.

- C. Install drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.
 - 1. Install hose-end drain valves at low points in water mains, risers, and branches.
 - 2. Install stop-and-waste drain valves where indicated.

3.6 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 15 Section 15060 "Hangers and Supports" for pipe hanger and support devices. Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
- B. Install supports according to Division 15 Section 15060 "Hangers and Supports."
- C. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 3/4 and Smaller: 60 inches with 3/8-inch rod.
 - 2. NPS 1 and NPS 1-1/4: 72 inches with 3/8-inch rod.
 - 3. NPS 1-1/2 and NPS 2: 96 inches with 3/8-inch rod.
- D. Install supports for vertical copper tubing every 10 feet.
- E. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.7 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Install piping adjacent to equipment and machines to allow service and maintenance.
- C. Connect domestic water piping to exterior water service piping. Use transition fitting to join dissimilar piping materials.
- D. Connect domestic water piping to service piping with shutoff valve, and extend and connect to the following:

1. Plumbing Fixtures: Cold supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section 15410 "Plumbing Fixtures."
2. Equipment: Cold supply piping as indicated, but not smaller than equipment connections. Provide shutoff valve and union for each connection.

3.8 FIELD QUALITY CONTROL

A. Inspect domestic water piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of the State's Representative:
 - a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - b. Final Inspection: Arrange for final inspection by the State's Representative to observe tests specified below and to ensure compliance with requirements.
3. Reinspection: If the State's Representative find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by the State's Representative.

B. Test domestic water piping as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced domestic water piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
3. Cap and subject piping to static water pressure of 50 psig above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
5. Prepare reports for tests and required corrective action.

3.9 CLEANING

A. Clean and disinfect potable domestic water piping as follows:

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Domestic Water Piping

1. Purge new piping and parts of existing domestic water piping that have been altered, extended, or repaired before using.
 2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction or, if methods are not prescribed, procedures described in either AWWA C651 or AWWA C652 or as described below:
 - a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
 - b. Fill and isolate system according to either of the following:
 - 1) Fill system or part thereof with water/chlorine solution with at least 50 ppm of chlorine. Isolate with valves and allow to stand for 24 hours.
 - 2) Fill system or part thereof with water/chlorine solution with at least 200 ppm of chlorine. Isolate and allow to stand for three hours.
 - c. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.
 - d. Submit water samples in sterile bottles to the State's Representative. Repeat procedures if biological examination shows contamination.
- B. Prepare and submit reports of purging and disinfecting activities.
- C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

END OF SECTION 15140

SECTION 15150
SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes soil and waste, sanitary drainage and vent piping inside the building.

1.2 SUBMITTALS

- A. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping.

PART 2 - PRODUCTS

2.1 PIPING MATERIALS

- A. Flexible Transition Couplings for Underground Nonpressure Piping: ASTM C 1173 with elastomeric sleeve. Include ends of same sizes as piping to be joined and include corrosion-resistant metal band on each end.
- B. Transition Couplings for Underground Pressure Piping: AWWA C219 metal, sleeve-type coupling or other manufactured fitting same size as, with pressure rating at least equal to and ends compatible with, piping to be joined.
- C. ABS Pipe: ASTM D 2661, Schedule 40, solid wall.
 - 1. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- D. Cellular-Core, ABS Pipe: ASTM F 628, Schedule 40.
 - 1. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
- E. ABS Special Fittings: ASTM F 409, drainage-pattern tube and tubular fittings with ends as required for application.

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- F. PVC Pipe: ASTM D 2665, solid-wall drain, waste, and vent.
 - 1. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.
- G. Cellular-Core, Schedule 40, PVC Pipe: ASTM F 891, Schedule 40.
 - 1. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.
- H. Cellular-Core, Sewer and Drain Series, PVC Pipe: ASTM F 891, Series PS 100.
 - 1. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Series PS 100 sewer and drain pipe.
- I. PVC Special Fittings: ASTM F 409, drainage-pattern tube and tubular fittings with ends as required for application.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

- A. Transition and special fittings with pressure ratings at least equal to piping pressure ratings may be used in applications below, unless otherwise indicated.
- B. Flanges may be used on aboveground pressure piping, unless otherwise indicated.
- C. Aboveground, Soil, Waste, and Vent Piping: Use any of the following piping materials for each size range:
 - 1. NPS 1-1/4 and NPS 1-1/2: ABS pipe, ABS socket fittings, and solvent-cemented joints.
 - 2. NPS 1-1/4 and NPS 1-1/2: Cellular-core, ABS pipe; ABS socket fittings; and solvent-cemented joints.
 - 3. NPS 1-1/4 and NPS 1-1/2: PVC pipe, PVC socket fittings, and solvent-cemented joints.
 - 4. NPS 1-1/4 and NPS 1-1/2: Cellular-core, Schedule 40, PVC pipe; PVC socket fittings; and solvent-cemented joints.
 - 5. NPS 2 to NPS 4: Hubless, cast-iron soil piping and one of the following:
 - a. Couplings: Heavy-duty, Type 304, stainless steel.
 - b. Couplings: Compact, stainless steel.
 - 6. NPS 2 to NPS 4: ABS pipe, ABS socket fittings, and solvent-cemented joints.

7. NPS 2 to NPS 4: Cellular-core, ABS pipe; ABS socket fittings; and solvent-cemented joints.
 8. NPS 2 to NPS 4: PVC pipe, PVC socket fittings, and solvent-cemented joints.
 9. NPS 2 to NPS 4: Cellular-core, Schedule 40, PVC pipe; PVC socket fittings; and solvent-cemented joints.
- D. Underground, Soil, Waste, and Vent Piping: Use **[any of]** the following piping materials for each size range:
1. NPS 2 to NPS 4: Hubless, cast-iron soil piping and one of the following:
 - a. Couplings: Heavy-duty, Type 304, stainless steel.
 - b. Couplings: Compact, stainless steel.
 2. NPS 2 to NPS 4: ABS pipe, ABS socket fittings, and solvent-cemented joints.
 3. NPS 2 to NPS 4: Cellular-core, ABS pipe; ABS socket fittings; and solvent-cemented joints.
 4. NPS 2 to NPS 4: PVC pipe, PVC socket fittings, and solvent-cemented joints.
 5. NPS 2 to NPS 4: Cellular-core, Schedule 40, PVC pipe; PVC socket fittings; and solvent-cemented joints.

3.2 PIPING INSTALLATION

- A. Refer to Division 2 Section 02530 "Sanitary Sewerage" for Project-site sanitary sewer piping.
- B. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for basic piping installation.
- C. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for wall penetration systems.
- E. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
- F. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change

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direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

- G. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- H. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
 - 1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 - 2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
 - 3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- I. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.
- J. Install ABS soil and waste drainage and vent piping according to ASTM D 2661.
- K. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- L. Install underground ABS and PVC soil and waste drainage piping according to ASTM D 2321.
- M. Do not enclose, cover, or put piping into operation until it is inspected and approved by the State's Representative.

3.3 JOINT CONSTRUCTION

- A. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for basic piping joint construction.
- B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
 - 1. Gasketed Joints: Make with rubber gasket matching class of pipe and fittings.
 - 2. Hubless Joints: Make with rubber gasket and sleeve or clamp.

- C. PVC Nonpressure Piping Joints: Join piping according to ASTM D 2665.

3.4 HANGER AND SUPPORT INSTALLATION

- A. Refer to Division 15 Section 15060 "Hangers and Supports" for pipe hanger and support devices. Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
 - a. 100 Feet and Less: MSS Type 1, adjustable, steel clevis hangers.
- B. Install supports according to Division 15 Section 15060 "Hangers and Supports."
- C. Support vertical piping and tubing at base and at each floor.
- D. Install hangers for ABS and PVC piping with the following maximum horizontal spacing and minimum rod diameters:
 - 1. NPS 1-1/2 and NPS 2: 48 inches with 3/8-inch rod.
 - 2. NPS 3: 48 inches with 1/2-inch rod.
 - 3. NPS 4 and NPS 5: 48 inches with 5/8-inch rod.
- E. Install supports for vertical ABS and PVC piping every 48 inches.
- F. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.5 CONNECTIONS

- A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage and vent piping to the following:
 - 1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section 15410 "Plumbing Fixtures."
 - 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by plumbing code.
 - 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 15 Section 15430 "Plumbing Specialties."

3.6 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of the State's Representative.
 - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - 2. Final Inspection: Arrange for final inspection by the State's Representative to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If the State's Representative finds that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by the State's Representative.
- D. Test sanitary drainage and vent piping according to procedures of the State's Representative.
 - 1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 - 2. Prepare reports for tests and required corrective action.

3.7 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

3.8 PROTECTION

- A. Exposed ABS and PVC Piping: Protect plumbing vents exposed to sunlight with two coats of water-based latex paint. Color to match adjacent materials.

END OF SECTION 15150

SECTION 15410 PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes plumbing fixtures and related components.
- B. See Division 15 Section 15430 "Plumbing Specialties" for backflow preventers and specialty fixtures not in this Section.

1.2 DEFINITIONS

- A. Accessible Fixture: Plumbing fixture that can be approached, entered, and used by people with disabilities.

1.3 SUBMITTALS

- A. Product Data: Include selected fixture and trim, fittings, accessories, appliances, appurtenances, equipment, and supports and indicate materials and finishes, dimensions, construction details, and flow-control rates for each type of fixture indicated.
- B. Operation and maintenance data.

1.4 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the current approved edition of Title 24, California Building Code, CEC, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; Public Law 101-336, "Americans with Disabilities Act"; U.S. Architectural & Transportation Barriers Compliance Board's "Uniform Federal Accessibility Standards (UFAS), 1985-494-187" and the current approved edition of California Code of Regulations, Title 24, California Building Code and California Plumbing Code about plumbing fixtures for people with disabilities.
- C. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," and the current approved edition of California Code of Regulations, Title 24, California Plumbing Code about water flow and consumption rates for plumbing fixtures.

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Plumbing Fixtures

- D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.
- E. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.
- F. Comply with the following applicable standards and other requirements specified for plumbing fixtures:
 - 1. Enameled, Cast-Iron Fixtures: ASME A112.19.1M.
 - 2. Hand Sinks: NSF 2 construction.
 - 3. Vitreous-China Fixtures: ASME A112.19.2M.
 - 4. Water-Closet, Flush Valve, Tank Trim: ASME A112.19.5.
 - 5. Water-Closet, Flushometer Tank Trim: ASSE 1037.
- G. Comply with the following applicable standards and other requirements specified for lavatory and sink faucets:
 - 1. Backflow Protection Devices for Faucets with Hose-Thread Outlet: ASME A112.18.3M.
 - 2. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
 - 3. Faucet Hose: ASTM D 3901.
 - 4. Faucets: ASME A112.18.1M.
 - 5. Hose-Connection Vacuum Breakers: ASSE 1011.
 - 6. Hose-Coupling Threads: ASME B1.20.7.
 - 7. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
 - 8. NSF Materials: NSF 61.
 - 9. Pipe Threads: ASME B1.20.1.
 - 10. Supply and Drain Fittings: ASME A112.18.1M.
- H. Comply with the following applicable standards and other requirements specified for shower faucets:
 - 1. Backflow Protection Devices for Hand-Held Showers: ASME A112.18.3M.
 - 2. Combination, Pressure-Equalizing and Thermostatic-Control Antiscald Faucets: ASSE 1016.
 - 3. Faucets: ASME A112.18.1M.
 - 4. Hand-Held Showers: ASSE 1014.
 - 5. High-Temperature-Limit Controls for Thermal-Shock-Preventing Devices: ASTM F 445.
 - 6. Manual-Control Antiscald Faucets: ASTM F 444.
 - 7. Pipe Threads: ASME B1.20.1.
 - 8. Pressure-Equalizing-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.
 - 9. Thermostatic-Control Antiscald Faucets: ASTM F 444 and ASSE 1016.
- I. Comply with the following applicable standards and other requirements specified for miscellaneous fittings:

1. Atmospheric Vacuum Breakers: ASSE 1001.
 2. Brass and Copper Supplies: ASME A112.18.1M.
 3. Manual-Operation Flushometers: ASSE 1037.
 4. Plastic Tubular Fittings and Piping: ASTM F 409.
 5. Sensor-Operation Flushometers: ASSE 1037 and UL 1951.
 6. Tubular Brass Drainage Fittings and Piping: ASME A112.18.1M.
- J. Comply with the following applicable standards and other requirements specified for miscellaneous components:
1. Floor Drains: ASME A112.21.1M.
 2. Grab Bars: ASTM F 446.
 3. Hose-Coupling Threads: ASME B1.20.7.
 4. Off-Floor Fixture Supports: ASME A112.6.1M.
 5. Pipe Threads: ASME B1.20.1.
 6. Plastic Toilet Seats: ANSI Z124.5.
 7. Supply and Drain Protective Shielding Guards: ICC A117.1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
 2. 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.

2.2 LAVATORY FAUCETS

- A. Lavatory Faucet, one at each lavatory: Include hot- and cold-water indicators; coordinate faucet inlets with supplies and fixture holes and outlet with spout and fixture receptor.
1. Available Manufacturers:
 - a. Chicago, #857-E12-689.
 - b. Chicago, #802-665.
 - c. Delta, #701_HDF with 86T51 plate.
 - d. Delta, #2508-HDF.
 - e. Moen, #8886.
 - f. Sloan, "Optima" #8110/8111.
 - g. Symmons, #S-61-G.
 - h. Symmons, #S-72-G.

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Plumbing Fixtures

- i. or approved equal.
2. Maximum Flow Rate: 2.0 gpm, unless otherwise indicated.
3. Finish: Polished chrome plate.
4. Handle: Soft Touch, Push button, self closing.
5. Drain: Grid.

2.3 WALL HYDRANT (Hose Bibb)

- A. Wall Hydrant Box, one at designated area on plans: Recessed hose box with wall flange and door, bronze casing, inlet connection, vacuum breaker, removable loose key wheel handle and vandal resistant lockshield bonnets. Mount hydrant face flush with finished wall surface. Bottom edge of flange at +15" above adjacent concrete surface. When installed in split face cmu, grind exterior surface of split face smooth under area of flange to receive wall hydrant.

1. Available Manufacturers:
 - a. Acorn Products, #8151.
 - b. approved equal.
2. Finish: Stainless steel.
3. Connection: Universal Inlet.
4. Vacuum Breaker: 3/4" Intregal.
5. Handle: Removable loose key wheel handle.
6. Drain: Stopper with chain.

2.4 FLUSHOMETERS

- A. Flushometer, one at each water closet: Cast-brass body with corrosion-resistant internal components, control stop with check valve, vacuum breaker, and copper or brass tubing, and polished chrome-plated finish on exposed parts.

1. Available Manufacturers:
 - a. Delaney, "Flushboy" F534-1.6.
 - b. Sloan, "Optima" #8110/8111.
 - c. Sloan, "Royal" 143-1.6.
 - d. Zurn, "Aqua Sense" A #ZR 6000XL-WS1.
 - e. Zurn, Z-6143XL-ADA-WS1
 - f. or approved equal
2. Trip Mechanism: Oscillating, lever-handle actuator.
3. Consumption: 1.6 gal./flush.

2.5 TOILET SEATS

A. Toilet Seat, one at each water closet: Solid plastic.

1. Available Manufacturers:

- a. American Standard, "Church" 9500C.
- b. Kohler, "Lustra" K-4666-C.
- c. Olonite. #95.
- d. or approved equal

2. Color: White.

2.6 FIXTURE SUPPORTS

A. Water-Closet Support, one at each water closet: Water-closet combination carrier designed for accessible and standard mounting height. Include single or double, vertical or horizontal, hub-and-spigot or hubless waste fitting as required for piping arrangement; faceplates; couplings with gaskets; feet; and fixture bolts and hardware matching fixture. Include additional extension coupling, faceplate, and feet for installation in wide pipe space. Verify water closet support complies with requirements of selected water closet manufacturer.

1. Available Manufacturers:

- a. J. R. Smith, 0175, 0209, 0210, 0230, or 0240 Series.
- b. Josam, 12000 Series.
- c. Zurn, Z-1203, 1240, 1207 or 1208 Series.
- d. or approved equal.

B. Lavatory Support, one at each lavatory: Type II, lavatory carrier with concealed arms and tie rod. Include steel uprights with feet. Verify lavatory support complies with requirements of selected lavatory manufacturer.

1. Available Manufacturers:

- a. J. R. Smith, 0790 or 720 (E)
- b. Josam, 17115.
- c. Zurn, Z-1253.
- d. or approved equal.

2.7 WATER CLOSETS

A. Water Closets, one at each designated restroom: Wall-hanging, back-outlet, vitreous-china fixture designed for flushometer valve operation.

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Plumbing Fixtures

1. Available Products:
 - a. American Standard, Inc., "Afwall" 2258.125.
 - b. Crane Plumbing/Fiat Products, "Placidus" 3449.
 - c. Crane Plumbing/Flat products, "Rapidway" 3460.
 - d. Eljer, "Signature" 111-2105.
 - e. Kohler Co., "Kingston" K-4329.
 - f. Kohler Co., "Kingston" K-4430 (ADA).
 - g. or approved equal.
2. Style: Flushometer valve.
 - a. Bowl Type: Elongated with siphon-jet design.
 - 1) Design Consumption: 1.6 gal./flush.
 - b. Color: White.

2.8 LAVATORIES

- A. Lavatories, one at each designated restroom: Wall-hanging, enameled, cast-iron fixture.
 1. Available Products:
 - a. American Standard, Inc., "Declyn" 0321.075.
 - b. American Standard, Inc., "Regalyn" 4867.004.
 - c. Crane Plumbing/Fiat Products, "Westmont" 1318V.
 - d. Eljer, "Bucknell Lavatory" 052-0181.
 - e. Kohler Co., "Hudson" K-2861.
 - f. or approved equal.
 2. Size: 20 by 18 inches rectangular.
 3. Color: White.
 4. Faucet: Lavatory for separate drain.
 5. Supplies: NPS 3/8 chrome-plated copper with stops.
 6. Drain: Grid.
 7. Drain Piping: NPS 1-1/4 by NPS 1-1/2 chrome-plated cast-brass trap; NPS 1-1/2, 0.045-inch thick tubular brass waste to wall; and wall escutcheon.

PART 3 - EXECUTION

3.1 FIXTURE INSTALLATION

- A. Assemble fixtures, trim, fittings, and other components according to manufacturers' written instructions.

- B. For wall-hanging fixtures, install off-floor supports affixed to building substrate.
 - 1. Use carrier supports with waste fitting and seal for back-outlet fixtures.
 - 2. Use carrier supports without waste fitting for fixtures with tubular waste piping.
 - 3. Use chair-type carrier supports with rectangular steel uprights for accessible fixtures.
- C. Install back-outlet, wall-hanging fixtures onto waste fitting seals and attach to supports.
- D. Install floor-mounting fixtures on closet flanges or other attachments to piping or building substrate.
- E. Install wall-hanging fixtures with tubular waste piping attached to supports.
- F. Install fixtures level and plumb according to manufacturers' written instructions and roughing-in drawings.
- G. Install water-supply piping with stop on each supply to each fixture to be connected to water distribution piping. Attach supplies to supports or substrate within pipe spaces behind fixtures. Install stops in locations where they can be easily reached for operation.
 - 1. Exception: Use ball, gate, or globe valve if stops are not specified with fixture. Refer to Division 15 Section "Valves" for general-duty valves.
- H. Install trap and tubular waste piping on drain outlet of each fixture to be directly connected to sanitary drainage system.
- I. Install tubular waste piping on drain outlet of each fixture to be indirectly connected to drainage system.
- J. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.
- K. Install toilet seats on water closets.
- L. Install faucet-spout fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- M. Install water-supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.

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Plumbing Fixtures

- N. Install faucet, flow-control fittings with specified flow rates and patterns in faucet spouts if faucets are not available with required rates and patterns. Include adapters if required.
- O. Install traps on fixture outlets.
 - 1. Exception: Omit trap on fixtures with integral traps.
- P. Install escutcheons at piping wall ceiling penetrations in exposed, finished locations. Use deep-pattern escutcheons if required to conceal protruding fittings. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for escutcheons.
- Q. Seal joints between fixtures and walls, floors, and counters using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color. Refer to Division 7 Section 07920 "Joint Sealants " for sealant and installation requirements.

3.2 CONNECTIONS

- A. Connect water supplies from water distribution piping to fixtures.
- B. Connect drain piping from fixtures to drainage piping.
- C. Supply and Waste Connections to Plumbing Fixtures: Connect fixtures with water supplies, stops, risers, traps, and waste piping. Use size fittings required to match fixtures. Connect to plumbing piping.
- D. Supply and Waste Connections to Fixtures and Equipment Specified in Other Sections: Connect fixtures and equipment with water supplies, stops, risers, traps, and waste piping specified. Use size fittings required to match fixtures and equipment. Connect to plumbing piping.

3.3 PROTECTION

- A. Provide protective covering for installed fixtures and fittings.
- B. Do not allow use of fixtures for temporary facilities unless approved in writing by the State's Representative.

END OF SECTION 15410

SECTION 15415 DRINKING FOUNTAINS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Drinking fountains.

1.2 SUBMITTALS

- A. Product Data: Include rated capacities; furnished specialties; and accessories for each type of fixture indicated.
- B. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities"; Public Law 90-480, "Architectural Barriers Act"; and Public Law 101-336, "Americans with Disabilities Act"; about fixtures for people with disabilities.
- B. Regulatory Requirements: Comply with requirements in the U.S. Architectural & Transportation Barriers Compliance Board's "Uniform Federal Accessibility Standards (UFAS), 1985-494-187" about fixtures for people with disabilities.
- C. Regulatory Requirements: Comply with requirements in the current approved edition of the California Code of Regulations, Title 24, California Building Code about fixtures for people with disabilities.
- D. NSF Standard: Comply with NSF 61, "Drinking Water System Components--Health Effects," for fixture materials that will be in contact with potable water.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

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Drinking Fountains

2. 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.

2.2 DRINKING FOUNTAINS

- A. Drinking Fountains, one each at designated area shown on plans: Accessible, wall-hanging fixture made of stainless steel complying with ASME A112.19.2M for drinking fountains.

1. Available Products:

- a. Metal Drinking Fountains:

- 1) Elkay Manufacturing Co., EDFP217FPC.
 - 2) Filtrine Manufacturing Co., Model #90-HLFR.
 - 3) Halsey Taylor, HRFSEBPFR.
 - 4) Haws Corporation, Model #1119FR.
 - 5) Haws Corporation, Model 3150.
 - 6) Murdock, Inc., MC76-2.
 - 7) or approved equal.
2. Receptor Shape: Rectangular.
 3. Back Panel: Stainless-steel wall plate behind drinking fountain.
 4. Bubblers: Two, with automatic stream regulator, located on deck.
 5. Control: Push button or Push bar.
 6. Supply: NPS 3/8 with ball, gate, or globe valve.
 7. Drain: Grid with NPS 1-1/4 minimum horizontal waste and trap
 8. Support: Type I, water-cooler carrier.

PART 3 - EXECUTION

3.1 APPLICATIONS

- A. Use carrier off-floor supports for wall-hanging fixtures, unless otherwise indicated.
- B. Use mounting frames for recessed water coolers, unless otherwise indicated.
- C. Set freestanding and pedestal drinking fountains on floor.
- D. Use chrome-plated brass or copper tube, fittings, and valves in locations exposed to view. Plain copper tube, fittings, and valves may be used in concealed locations.

3.2 INSTALLATION

- A. Install off-floor supports affixed to building substrate and attach wall-hanging fixtures, unless otherwise indicated.
- B. Install mounting frames affixed to building construction and attach recessed water coolers to mounting frames, unless otherwise indicated.
- C. Install fixtures level and plumb.
- D. Install water-supply piping with shutoff valve on supply to each fixture to be connected to water distribution piping. Use ball, gate, or globe valve. Install valves in locations where they can be easily reached for operation. Refer to Division 15 Section 15110 "Valves" for general-duty valves.
- E. Install trap and waste piping on drain outlet of each fixture to be connected to sanitary drainage system.
- F. Install pipe escutcheons at wall penetrations in exposed, finished locations. Use deep-pattern escutcheons where required to conceal protruding pipe fittings. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for escutcheons.

3.3 CONNECTIONS

- A. Connect water supplies from water distribution piping to fixtures.
- B. Connect drain piping from fixtures to drainage piping.

3.4 ADJUSTING

- A. Adjust fixture flow regulators for proper flow and stream height.

END OF SECTION 15415

SECTION 15430
PLUMBING SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following plumbing specialties:

1. Backflow preventers.
2. Water regulators.
3. Strainers.
4. Trap seal primer valves.
5. Miscellaneous piping specialties.
6. Cleanouts.
7. Floor drains.

1.2 PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:

1. Domestic Water Piping: 125 psig.
2. Sanitary Waste and Vent Piping: 10-foot head of water.

1.3 SUBMITTALS

A. Product Data: Include rated capacities and indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following:

1. Backflow preventers and water regulators.
2. Water hammer arresters, air vents, and trap seal primer valves and systems.
3. Hose bibbs and hydrants.
4. Backwater valves, cleanouts, floor drains, open receptors, and trench drains.

B. Operation and maintenance data for the following:

1. Backflow preventers and water regulators.
2. Trap seal primer valves and systems.

1.4 QUALITY ASSURANCE

A. Plumbing specialties shall bear label, stamp, or other markings of specified testing agency.

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- B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the current approved edition of the California Electrical Code, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- C. CCR Compliance: Comply with the current approved edition of the California Code of Regulations, Title 24, California Plumbing Code.
- D. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for piping materials and installation.
- E. NSF Compliance:
 - 1. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic domestic water piping components. Include marking "NSF-pw" on plastic potable-water piping and "NSF-dwv" on plastic drain, waste, and vent piping.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.
 - 2. 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.

2.2 BACKFLOW PREVENTERS

- A. Available Manufacturers:
 - 1. Cla-Val Co.
 - 2. Watts Industries, Inc.; Water Products Div.
 - 3. Zurn Industries, Inc.; Wilkins Div.
 - 4. or approved equal.
- B. General: ASSE standard, backflow preventers.
 - 1. NPS 2 and Smaller: Bronze body with threaded ends.
 - 2. Interior Components: Corrosion-resistant materials.
 - 3. Exterior Finish: Polished chrome plate if used in chrome-plated piping system.

4. Strainer: On inlet, if indicated.

- C. Hose-Connection Vacuum Breakers: ASSE 1011, nickel plated, with nonremovable and manual drain features, and ASME B1.20.7, garden-hose threads on outlet. Units attached to rough-bronze-finish hose connections may be rough bronze.

2.3 WATER REGULATORS

A. Available Manufacturers:

1. Cla-Val Co.
2. Watts Industries, Inc.; Water Products Div.
3. Zurn Industries, Inc.; Wilkins Div.
4. or approved equal.

B. General: ASSE 1003, water regulators, rated for initial working pressure of 150 psig minimum. Include integral factory-installed or separate field-installed, Y-pattern strainer.

1. NPS 2 and Smaller: Bronze body with threaded ends.
 - a. General-Duty Service: Single-seated, direct operated, unless otherwise indicated.
2. Interior Components: Corrosion-resistant materials.
3. Exterior Finish: Polished chrome plate if used in chrome-plated piping system.

2.4 STRAINERS

A. Strainers: Y-pattern, unless otherwise indicated, and full size of connecting piping. Include ASTM A 666, Type 304, stainless-steel screens with 3/64-inch round perforations, unless otherwise indicated.

1. Pressure Rating: 125-psig minimum steam working pressure, unless otherwise indicated.
2. NPS 2 and Smaller: Bronze body, with female threaded ends.
3. Y-Pattern Strainers: Screwed screen retainer with centered blowdown.
 - a. Drain: Factory- or field-installed, hose-end drain valve.

2.5 TRAP SEAL PRIMER VALVES

A. Supply-Type Trap Seal Primer Valves: ASSE 1018, water-supply-fed type, with the following characteristics:

1. Available Manufacturers:

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- a. Josam Co.
 - b. Smith, Jay R. Mfg. Co.
 - c. Watts Industries, Inc.; Water Products Div.
 - d. Zurn Industries, Inc.; Jonespec Div.
 - e. or approved equal.
2. 125-psig minimum working pressure.
 3. Bronze body with atmospheric-vented drain chamber.
 4. Inlet and Outlet Connections: NPS 1/2 threaded, union, or solder joint.
 5. Gravity Drain Outlet Connection: NPS 1/2 threaded or solder joint.
 6. Finish: Chrome plated, or rough bronze for units used with pipe or tube that is not chrome finished.

2.6 DRAIN VALVES

- A. Hose-End Drain Valves: MSS SP-110, NPS 3/4 ball valve, rated for 400-psig minimum CWP. Include two-piece, copper-alloy body with standard port, chrome-plated brass ball, replaceable seats and seals, blowout-proof stem, and vinyl-covered steel handle.
 1. Inlet: Threaded or solder joint.
 2. Outlet: Short-threaded nipple with ASME B1.20.7, garden-hose threads and cap.

2.7 MISCELLANEOUS PIPING SPECIALTIES

- A. Water Hammer Arresters: ASSE 1010 or PDI-WH 201, metal-bellows type with pressurized metal cushioning chamber. Sizes indicated are based on ASSE 1010 or PDI-WH 201, Sizes A through F.
 1. Available Manufacturers:
 - a. Josam Co.
 - b. Smith, Jay R. Mfg. Co.
 - c. Tyler Pipe; Wade Div.
 - d. Zurn Industries, Inc.; Specification Drainage Operation.
 - e. or approved equal.
- B. Hose Bibbs: Bronze body with replaceable seat disc complying with ASME A112.18.1M for compression-type faucets. Include NPS 1/2 or NPS 3/4 threaded or solder-joint inlet, of design suitable for pressure of at least 125 psig; integral nonremovable, drainable hose-connection vacuum breaker; and garden-hose threads complying with ASME B1.20.7 on outlet.
 1. Finish for Service Areas: Rough bronze, or chrome or nickel plated.
 2. Operation for Service Areas: Operating key.
 3. Include operating key with each operating-key hose bibb.

- C. Stack Flashing Fittings: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.
- D. Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and set-screws to secure to vent pipe.
- E. Vent Terminals: Commercially manufactured, shop- or field-fabricated, frost-proof assembly constructed of galvanized steel, copper, or lead-coated copper. Size to provide 1-inch enclosed air space between outside of pipe and inside of flashing collar extension, with counterflashing.
- F. Conductor Nozzles: Bronze body with threaded inlet for connected conductor size, and bronze wall flange with mounting holes.
 - 1. Finish: bronze.

2.8 CLEANOUTS

- A. Cleanouts, at locations shown on drawings: Comply with ASME A112.36.2M or ASME A112.3.1.
 - 1. Application: Floor cleanout.
 - 2. Available Products:
 - a. Josam Co., 56010-15.
 - b. Smith, Jay R. Mfg. Co., 4032L-U.
 - c. Zurn Industries, Inc., Z1400-VP.
 - d. or approved equal.
 - 3. Body or Ferrule Material: Cast iron.
 - 4. Clamping Device: Not required.
 - 5. Outlet Connection: Spigot.
 - 6. Closure: Brass plug with straight threads and gasket.
 - 7. Adjustable Housing Material: Cast iron with set-screws or other device.
 - 8. Frame and Cover Material and Finish: Painted cast iron.
 - 9. Frame and Cover Shape: Round.
 - 10. Top Loading Classification: Medium Duty.

2.9 FLOOR DRAINS

- A. Floor Drains, at locations shown on drawings: Comply with ASME A112.21.1M.
 - 1. Application: Floor drain.
 - 2. Available Products:
 - a. Josam Co., 30000-2-8--VP.
 - b. Josam Co., 30000-12-14-80-92.

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- c. Smith, Jay R. Mfg. Co., 2005-(B)(G)(H)(S).
 - d. Tyler Pipe, Wade Div., 1100G-27-39-179.
 - e. Zurn Industries, Inc., Z-415-8SH-G-Y.
 - f. or approved equal
- 3. Body Material: Gray iron.
 - 4. Outlet: Bottom.
 - 5. Exposed Surfaces and Interior Lining: Galvanized.
 - 6. Sediment Bucket: Required.
 - 7. Top or Strainer Material: Gray iron.
 - 8. Top Shape: Square.
 - 9. Dimensions of Top or Strainer: 8" x 8".
 - 10. Top Loading Classification: Medium Duty.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods" for piping joining materials, joint construction, and basic installation requirements.
- B. Install pressure regulators with inlet and outlet shutoff valves and balance valve bypass. Install pressure gages on inlet and outlet.
- C. Install strainers on supply side of each control valve, pressure regulator, and solenoid valve.
- D. Install trap seal primer valves with outlet piping pitched down toward drain trap a minimum of 1 percent and connect to floor-drain body, trap, or inlet fitting. Adjust valve for proper flow.
- E. Install backwater valves in building drain piping. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- F. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:
 - 1. Size same as drainage piping up to NPS 4.
- G. Install cleanout deck plates with top flush with finished floor, for floor cleanouts for piping below floors.
- H. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to manufacturer's written instructions.

- I. Install frost-proof vent caps on each vent pipe passing through roof. Maintain 1-inch clearance between vent pipe and roof substrate.
 - J. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
 - 1. Position floor drains for easy access and maintenance.
 - 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
 - a. Radius, 30 Inches or Less: Equivalent to 2 percent slope, but not less than 1/4-inch total depression.
 - b. Radius, 30 to 60 Inches: Equivalent to 2 percent slope.
 - c. Radius, 60 Inches or Larger: Equivalent to 2 percent slope, but not greater than 1 1/2 inch total depression.
 - 3. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
 - K. Fasten wall-hanging plumbing specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.
 - L. Fasten recessed-type plumbing specialties to reinforcement built into walls.
 - M. Install individual shutoff valve in each water supply to plumbing specialties. Use ball, gate, or globe valve if specific valve is not indicated. Install shutoff valves in accessible locations. Refer to Division 15 Section "Valves" for general-duty ball, butterfly, check, gate, and globe valves.
 - N. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
 - O. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and at millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.
- 3.2 CONNECTIONS
- A. Install piping adjacent to equipment to allow service and maintenance.
 - B. Connect plumbing specialties and devices that require power according to Division 16 Sections.
- 3.3 LABELING AND IDENTIFYING

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Plumbing Specialties

- A. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplate or sign on or near each backflow preventer, and trap seal primer system.
 - 1. Text: Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit.
 - 2. Refer to Division 15 Section 15050 "Basic Mechanical Materials and Methods Mechanical Identification" for nameplates and signs.

3.4 PROTECTION

- A. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 15430

SECTION 16050
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Raceways.
 - 2. Building wire and connectors.
 - 3. Supporting devices for electrical components.
 - 4. Electrical identification.
 - 5. Electrical demolition.
 - 6. Cutting and patching for electrical construction.

1.2 SUBMITTALS

- A. Product Data: For electrical components.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the current approved edition of the California Electrical Code (CEC), Article 100, by a testing agency acceptable to the State's Representative, and marked for intended use.
- B. Comply with NFPA 70, CEC, and NEC.

1.4 COORDINATION

- A. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work.
- B. Where electrical identification devices are applied to field-finished surfaces, coordinate installation of identification devices with completion of finished surface.

PART 2 - PRODUCTS

2.1 RACEWAYS

- A. EMT: Electrical metallic tubing; ANSI C80.3, zinc-coated steel, with set-screw fittings.

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- B. FMC: Flexible metal conduit; zinc-coated steel.
- C. IMC: Intermediate metal conduit; ANSI C80.6, zinc-coated steel, with threaded fittings.
- D. RMC: Rigid metal conduit; galvanized rigid steel; ANSI C80.1.
- E. RNC: Rigid nonmetallic conduit; NEMA TC 2, Schedule 40 PVC, with NEMA TC3 fittings.
- F. Raceway Fittings: Specifically designed for raceway type with which used.

2.2 WIRES, CABLES, AND CONNECTIONS

- A. Conductors, No. 10 AWG and Smaller: Solid copper.
- B. Conductors, Larger Than No. 10 AWG: Stranded copper.
- C. Insulation: Thermoplastic, rated 600 V, 75 deg C minimum, Type THW, THHN-THWN.
- D. Insulation for control wiring: Thermoplastic, rated 600 V, 75 deg C minimum, Type THW, THHN-THWN.
- E. Wire Connectors and Splices: Units of size, ampacity rating, material, type, and class suitable for service indicated.
 - 1. Connectors and splices for conductors sizes No. 10 AWG and smaller:
 - a. Wire pigtail connector of appropriate size for conductors. Ideal Pigtail connector or approved equal.
 - 2. Connectors and splices for conductors sizes No. 8 AWG and larger.
 - a. Compression connector of appropriate size for conductors, insulated with epoxy filled bag. Burndy compression connector and Scotch-Loc epoxy filled bags or approved equal.
 - 3. Connectors and splices for ground conductors sizes No. 10 AWG and smaller, inside building electrical:
 - a. Compression connector of appropriate size for conductor. Burndy compression connector or approved equal.
 - b. Wire nuts for connecting ground conductors sizes No. 10 AWG and smaller are not allowed.
 - 4. Connectors and splices for conductors in pull boxes:
 - a. Compression connector of appropriate size for conductors, insulated with epoxy filled bag. Burndy compression connector and Scotch-Loc epoxy filled bags or approved equal.

2.3 SUPPORTING DEVICES

- A. Material: Cold-formed steel, with corrosion-resistant coating.

- B. Metal Items for Use in Damp Locations: Hot-dip galvanized steel.
- C. Slotted-Steel Channel: Flange edges turned toward web, and 9/16-inch-diameter slotted holes at a maximum of 2 inches o.c., in webs. Strength rating to suit structural loading.
- D. Slotted Channel Fittings and Accessories: Recommended by the manufacturer for use with the type and size of channel with which used.
 - 1. Materials: Same as channels and angles, except metal items may be stainless steel.
- E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
- F. Expansion Anchors: Carbon-steel wedge or sleeve type.
- G. Toggle Bolts: All-steel springhead type.

2.4 ELECTRICAL IDENTIFICATION

- A. Identification Device Colors: Use those prescribed by ANSI A13.1, CEC, and these Specifications.
- B. Colored Adhesive Marking Tape for Raceways, Wires, and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick.
- C. Tape Markers for Conductors: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.
- D. Color-Coding Cable Ties: Type 6/6 nylon, self-locking type. Colors to suit coding scheme.
- E. Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch minimum thickness for signs up to 20 sq. in. and 1/8-inch minimum thickness for larger sizes. Engraved legend in black letters on white background.
- F. Warning and Caution Signs: Preprinted; comply with 29 CFR 1910.145, Chapter XVII. Colors, legend, and size appropriate to each application.
 - 1. Interior Units: Aluminum, baked-enamel-finish, punched or drilled for mechanical fasteners.
 - 2. Exterior Units: Weather-resistant, nonfading, preprinted, cellulose-acetate butyrate with 0.0396-inch, galvanized-steel backing. 1/4-inch grommets in corners for mounting.

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- G. Fasteners for Nameplates and Signs: Self-tapping, stainless steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

PART 3 - EXECUTION

3.1 ELECTRICAL EQUIPMENT INSTALLATION

- A. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom.
- B. Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.
- C. Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

3.2 RACEWAY APPLICATION

- A. Indoor Installations:
 - 1. Exposed: EMT except in wet or damp locations, use IMC.
 - 2. Concealed in Walls or Ceilings: EMT.
 - 3. In Concrete Slab: RMC.
 - 4. Below Slab on Grade or in Crawlspace: RNC
 - 5. Connection to Vibrating Equipment: FMC.
 - 6. Boxes and Enclosures: NEMA 250, Type 1, unless otherwise indicated.
- B. Outdoor Installations:
 - 1. Exposed: RNC.
 - 2. Concealed: RNC.
 - 3. Underground, Single Run: RNC.
 - 4. Underground, Grouped: RNC.
 - 5. Connection to Vibrating Equipment: LFMC.
 - 6. Boxes and Enclosures: NEMA 250, Type 3R or Type 4, unless otherwise indicated.

3.3 RACEWAY AND CABLE INSTALLATION

- A. Conceal raceways and cables, unless otherwise indicated, within finished walls, ceilings, and floors.
- B. Keep legs of raceway bends in the same plane and keep straight legs of offsets parallel.

- C. Use RMC elbows where RNC turns out of slab.
- D. Install pull wires in empty raceways. Use No. 10 AWG zinc-coated steel or woven polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 24 inches of slack at each end of pull wires.
- E. Install raceways, 2-inch trade size and smaller, in maximum lengths of 200 feet and with a maximum of three 90-degree bends (270-degrees of total bends) or equivalent. Add pull boxes where necessary to accomplish this.

3.4 WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

- A. Application: Use wiring methods specified below to the extent permitted by applicable codes as interpreted by the State's Representative.
- B. Exposed Feeders: Insulated single conductors in raceway.
- C. Concealed Feeders in Ceilings Walls, Gypsum Board Partitions: Insulated single conductors in raceway.
- D. Concealed Feeders in Crawlspace: Insulated single conductors in raceway.
- E. Exposed Branch Circuits Including in Crawlspace: Insulated single conductors in raceway.
- F. Concealed Branch Circuits in Ceilings, Walls, Gypsum Board Partitions: Insulated single conductors in raceway.
- G. Underground Feeders and Branch Circuits: Insulated single conductors in raceway.

3.5 WIRING INSTALLATION

- A. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

3.6 ELECTRICAL SUPPORTING DEVICE APPLICATION

- A. Damp Locations and Outdoors: Hot-dip galvanized materials or nonmetallic, slotted channel system components.
- B. Dry Locations: Hot-dip galvanized materials or nonmetallic, slotted channel system components.
- C. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four with, 200-lb minimum design load for each support element.

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3.7 SUPPORT INSTALLATION

- A. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
- B. Size supports for multiple raceway or cable runs so capacity can be increased by a 25 percent minimum in the future.
- C. Support individual horizontal single raceways with separate, malleable-iron pipe hangers or clamps
- D. Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used.
- E. Secure electrical items and their supports to building structure, using the following methods unless other fastening methods are indicated:
 - 1. Wood: Wood screws or screw-type nails.
 - 2. Gypsum Board: Toggle bolts. Seal around sleeves with joint compound, both sides of wall.
 - 3. Masonry: Toggle bolts on hollow block and expansion bolts on solid block. Seal around sleeves with mortar, both sides of wall.
 - 4. Existing Concrete: Expansion bolts or threaded studs driven by powder charge and provided with lock washers.
 - 5. Fasteners for Damp, Wet, or Weather-Exposed Locations: Stainless steel.
 - 6. Light Steel: Sheet-metal screws.
 - 7. Fasteners: Select so load applied to each fastener does not exceed 25 percent of its proof-test load.

3.8 IDENTIFICATION MATERIALS AND DEVICES

- A. Install at locations for most convenient viewing without interference with operation and maintenance of equipment.
- B. Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.
- C. Self-Adhesive Identification Products: Clean surfaces before applying.
- D. Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box. Color-coding may be used for voltage and phase identification.
- E. Install warning, caution, and instruction signs where required to comply with 29 CFR 1910.145, Chapter XVII, and where needed to ensure safe operation and maintenance of electrical systems and of items to which they connect.

Indoors install engraved plastic-laminated instruction signs with approved legend where instructions are needed for system or equipment operation. Install metal-backed butyrate signs for outdoor items.

3.9 DEMOLITION

- A. Protect existing electrical equipment and installations indicated to remain. If damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- B. Accessible Work: Remove exposed electrical equipment and installations, indicated to be demolished, in their entirety.
- C. Abandoned Work: Cut and remove buried raceway and wiring, indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap raceways and patch surface to match existing finish.
- D. Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.
- E. All equipment shown on the plans to be salvaged shall be delivered to a location as designated by the State's Representative.

3.10 CUTTING AND PATCHING

- A. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces required to permit electrical installations. Perform cutting by skilled mechanics of trades involved.
- B. Repair, refinish and touch up disturbed finish materials and other surfaces to match adjacent undisturbed surfaces.

3.12 CONTINUITY OF SERVICE

- A. No interruption of services to any part of the existing facilities will be permitted without express permission in each instance from the State's Representative and State Park staff having jurisdiction over the project. Obtain written permission from the State's Representative for any interruption of the electrical power.
- B. The contractor shall organize their work to minimize the duration of the power interruption

END OF SECTION 16050

SECTION 16060 GROUNDING AND BONDING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes grounding of electrical systems and equipment. Requirements specified in this Section may be supplemented by requirements of other Sections.

1.2 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled under UL 467 as defined in the current approved edition of CEC, Article 100, by a testing agency acceptable to the State's Representative, and marked for intended use.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Apache Grounding/Erico Inc.
 - 2. Boggs, Inc.
 - 3. Chance/Hubbell.
 - 4. Copperweld Corp.
 - 5. Dossert Corp.
 - 6. Erico Inc.; Electrical Products Group.
 - 7. Framatome Connectors/Burndy Electrical.
 - 8. Galvan Industries, Inc.
 - 9. Harger Lightning Protection, Inc.
 - 10. Hastings Fiber Glass Products, Inc.
 - 11. Heary Brothers Lightning Protection Co.
 - 12. Ideal Industries, Inc.
 - 13. ILSCO.
 - 14. Kearney/Cooper Power Systems.
 - 15. Korns, C. C. Co.; Division of Robroy Industries.
 - 16. Lightning Master Corp.
 - 17. Lyncole XIT Grounding.
 - 18. O-Z/Gedney Co.; a business of the EGS Electrical Group.
 - 19. Racor, Inc.; Division of Hubbell.
 - 20. Robbins Lightning, Inc.

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- 21. Salisbury, W. H. & Co.
- 22. Superior Grounding Systems, Inc.
- 23. Thomas & Betts, Electrical.

2.2 GROUNDING CONDUCTORS

- A. For insulated conductors, comply with Division 16 Section "Conductors and Cables."
- B. Equipment Grounding Conductors: Insulated with green-colored insulation.
- C. Bare, Solid-Copper Conductors: ASTM B 3.
- D. Assembly of Bare, Stranded-Copper Conductors: ASTM B 8.
- E. Copper Bonding Conductor: No. 4 or No. 6 AWG, stranded copper conductor.
- F. Copper Bonding Jumper: Bare copper tape, braided bare copper conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.
- G. Grounding Bus: Bare, annealed copper bars of rectangular cross section, with insulated spacer.
- H. Connectors: Comply with IEEE 837 and UL 467; listed for use for specific types, sizes, and combinations of conductors and connected items. Compression type.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Use only copper conductors for both insulated and bare grounding conductors in direct contact with earth, concrete, crushed stone, and similar materials.
- B. In raceways, use insulated equipment grounding conductors.
- C. Equipment Grounding Conductors: Comply with CEC, Article 250, for types, sizes, and quantities of equipment grounding conductors, unless specific types, larger sizes, or more conductors than required by CEC are indicated.
 - 1. Install insulated equipment grounding conductors in branch circuits receptacle circuits.
 - 2. Busway Supply Circuits: Install insulated equipment grounding conductor from the grounding bus in the switchgear, switchboard, or distribution panel to equipment grounding bar terminal on busway.

3. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.
- D. Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
- E. Bonding Straps and Jumpers: Install so vibration by equipment mounted on vibration isolation hangers or supports is not transmitted to rigidly mounted equipment. Use exothermic-welded connectors for outdoor locations, unless a disconnect-type connection is required; then, use a bolted clamp. Bond straps directly to the basic structure taking care not to penetrate any adjacent parts. Install straps only in locations accessible for maintenance.
- F. Connections: Make connections so galvanic action or electrolysis possibility is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 1. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer to order of galvanic series.
 2. Make connections with clean, bare metal at points of contact.
 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
 6. Exothermic-Welded Connections: Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
 7. Noncontact Metal Raceway Terminations: If metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at entrances and exits with grounding bushings and bare grounding conductors, unless otherwise indicated.
 8. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by connector manufacturer. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.
 9. Moisture Protection: If insulated grounding conductors are connected to ground rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

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Grounding and Bonding

3.2 FIELD QUALITY CONTROL

A. Testing: Perform the following field quality-control testing:

1. After installing grounding system but before permanent electrical circuitry has been energized, test for compliance with requirements.

END OF SECTION 16060

SECTION 16071 SEISMIC CONTROLS FOR ELECTRICAL WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes seismic restraints and other earthquake-damage-reduction measures for electrical components. It applies to and complements optional seismic-restraint requirements in the various electrical component Sections of these Specifications.

1.2 DEFINITIONS

- A. Seismic Restraint: A fixed device (a seismic brace, an anchor bolt or stud, or a fastening assembly) used to prevent vertical or horizontal movement, or both vertical and horizontal movement, of an electrical system component during an earthquake.
- B. Mobile Structural Element: A part of the building structure such as a slab, floor structure, roof structure, or wall that may move independently of other structural elements during an earthquake.

1.3 SUBMITTALS

- A. Product Data: Illustrate and indicate types, styles, materials, strength, fastening provisions, and finish for each type and size of seismic-restraint component used. Include documentation of evaluation and approval of components by agencies acceptable to the State's Representative.
- B. Shop Drawings: For components, physical arrangements, and installation details not defined by Drawings. Indicate materials and show calculations, design analysis, details, and layouts, signed and sealed by a professional engineer.
- C. Pre-approval and Evaluation Documentation: By ICBO Evaluation Service, showing maximum ratings of restraints.
- D. Qualification data.

1.4 QUALITY ASSURANCE

- A. Comply with seismic-restraint requirements in the current approved edition of the California Building Code/Code of Regulations of OSHPD, unless requirements in this Section are more stringent.

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Seismic Controls for Electrical Work

1.5 COORDINATION

- A. Coordinate layout and installation of seismic bracing with building structure, architectural features, and mechanical, fire-protection, electrical, and other building systems.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Unistrut Corporation.
 - 2. B-Line Systems, Inc.
 - 3. Erico, Inc.
 - 4. GS Metals Corp.
 - 5. Loos & Company, Inc.
 - 6. Mason Industries, Inc,
 - 7. Powerstrut.
 - 8. Thomas & Betts Corp.
 - 9. Amber/Booth Company, Inc.

2.2 MATERIALS

- A. Use the following materials for restraints:
 - 1. Indoor Dry Locations: Steel, zinc plated.
 - 2. Damp Locations and Outdoors Steel, zinc plated.
 - 3. Locations where exposed to corrosive fumes: Stainless steel.
 - 4. Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four with, 200-lb minimum design load for each support element.

2.3 ANCHORAGE AND STRUCTURAL ATTACHMENT COMPONENTS

- A. Strength: Defined in reports by ICBO Evaluation Service or another agency acceptable to the State's Representative.
 - 1. Structural Safety Factor: Strength in tension and shear of components shall be at least twice the maximum seismic forces for which they are required to be designed.
- B. Concrete and Masonry Anchor Bolts and Studs: Steel-expansion wedge type.
- C. Concrete Inserts: Steel-channel type.

- D. Through Bolts: Structural type, hex head, high strength. Comply with ASTM A 325.
- E. Welding Lugs: Comply with MSS SP-69, Type 57.
- F. Bushing Assemblies for Wall-Mounted Equipment Anchorage: Assemblies of neoprene elements and steel sleeves designed for seismically rated rigid equipment mountings, and matched to the type and size of attachment devices used.

2.4 SEISMIC-BRACING COMPONENTS

- A. Slotted Steel Channel: 1-5/8-by-1-5/8-inch cross section, formed from 0.1046-inch-thick steel, with 9/16-by-7/8-inch slots at a maximum of 2 inches o.c. in webs, and flange edges turned toward web.
 - 1. Materials for Channel: ASTM A 570, GR 33.
 - 2. Materials for Fittings and Accessories: ASTM A 575, ASTM A 576, or ASTM A 36.
 - 3. Fittings and Accessories: Products of the same manufacturer as channels and designed for use with that product.
 - 4. Finish: Baked, rust-inhibiting, acrylic-enamel paint applied after cleaning and phosphate treatment, unless otherwise indicated.
- B. Channel-Type Bracing Assemblies: Slotted steel channel, with adjustable hinged steel brackets and bolts.
- C. Hanger Rod Stiffeners: Slotted steel channels, installed vertically, with internally bolted connections to hanger rod.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install seismic restraints according to applicable codes and regulations and as approved by the State's Representative, unless more stringent requirements are indicated.
- B. Install structural attachments as follows:
 - 1. Use bolted connections with steel brackets, slotted channel, and slotted-channel fittings to spread structural loads and reduce stresses.
 - 2. Attachments to Existing Concrete: Use expansion anchors.
 - 3. Holes for Expansion Anchors in Concrete: Drill at locations and to depths that avoid reinforcing bars.
 - 4. Attachments to Hollow Walls: Bolt to slotted steel channels fastened to wall with expansion anchors.
 - 5. Attachments to Wood Structural Members: Install bolts through members.

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Seismic Controls for Electrical Work

C. Install electrical equipment anchorage as follows:

1. Anchor panelboards, busway, and distribution units as follows:
 - a. Anchor equipment rigidly to a single mobile structural element or to a concrete base that is structurally tied to a single mobile structural element.
 - b. Bushings for Floor-Mounted Equipment Anchors: Install to allow for resilient media between anchor bolt or stud and mounting hole in concrete.
 - c. Anchor Bolt Bushing Assemblies for Wall-Mounted Equipment: Install to allow for resilient media where equipment or equipment-mounting channels are attached to wall.
 - d. Torque bolts and nuts on studs to values recommended by equipment manufacturer.

D. Install seismic bracing as follows:

1. Install bracing according to spacing and strengths indicated by approved analysis.
2. Expansion and Contraction: Install to allow for thermal movement of braced components.

E. Accommodation of Differential Seismic Motion: Make flexible connections in raceways, cables, wireway, cable trays, and busway where they cross expansion- and seismic-control joints, where adjacent sections or branches are supported by different structural elements, and where they terminate at electrical equipment anchored to a different mobile structural element from the one supporting them.

3.2 FIELD QUALITY CONTROL

- A. Testing Agency: The Contractor will engage a qualified testing and inspection agency to inspect seismic-control installation for compliance with indicated requirements.
- B. Reinspection: Correct deficiencies and verify by reinspection that work complies with requirements.
- C. Provide written report of tests and inspections.

END OF SECTION 16071

SECTION 16080 ELECTRICAL TESTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes general requirements for electrical field testing and inspecting. Detailed requirements are specified in each Section containing components that require testing. General requirements include the following:
 - 1. Qualifications of testing agencies and their personnel.
 - 2. Suitability of test equipment.
 - 3. Calibration of test instruments.
 - 4. Coordination requirements for testing and inspecting.
 - 5. Reporting requirements for testing and inspecting.

1.2 QUALITY ASSURANCE

- A. Testing Agency Qualifications: As specified in each Section containing electrical testing requirements and in subparagraph and associated subparagraph below.
 - 1. Independent Testing Agencies: Independent of manufacturers, suppliers, and installers of components to be tested or inspected.
 - a. Testing Agency's Field Supervisor for Power Component Testing: Person currently certified by the InterNational Electrical Testing Association or the National Institute for Certification in Engineering Technologies to supervise on-site testing specified in Division 16 power component Sections.
- B. Test Equipment Suitability: Comply with NETA ATS, Section 5.2.
- C. Test Equipment Calibration: Comply with NETA ATS, Section 5.3.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL TESTS AND INSPECTIONS

- A. If a group of tests are specified to be performed by an independent testing agency, prepare systems, equipment, and components for tests and inspections, and perform preliminary tests to ensure that systems, equipment, and components are ready for independent agency testing. Include the following minimum preparations as appropriate:

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Electrical Testing

1. Perform insulation-resistance tests.
 2. Perform continuity tests.
 3. Perform rotation test (for motors to be tested).
 4. Provide a stable source of single-phase, 240/120-V electrical power for test instrumentation at each test location.
- B. Test and Inspection Reports: In addition to requirements specified elsewhere, report the following:
1. Manufacturer's written testing and inspecting instructions.
 2. Tabulation of expected measurement results made before measurements.
 3. Tabulation of "as-found" and "as-left" measurement and observation results.

END OF SECTION 16080

SECTION 16120 CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.2 SUBMITTALS

- A. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:

2.2 CONDUCTORS AND CABLES

- A. Manufacturers:
 - 1. Alcan Aluminum Corporation; Alcan Cable Div.
 - 2. American Insulated Wire Corp.; a Leviton Company.
 - 3. General Cable Corporation.
 - 4. Senator Wire & Cable Company.
 - 5. Southwire Company.
- B. Refer to Part 3 "Conductor and Insulation Applications" Article for insulation type, cable construction, and ratings.
- C. Conductor Material: Copper, solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.
- D. Conductor Insulation Types: Type THHN-THWN.

2.3 CONNECTORS AND SPLICES

Section 16120 – Page 2
Conductors and Cables

- A. Manufacturers:
 - 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.
- B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 - EXECUTION

3.1 CONDUCTOR AND INSULATION APPLICATIONS

- A. Exposed Branch Circuits, including in Crawlspace: Type THHN-THWN, single conductors in raceway.
- B. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
- C. Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.

3.2 INSTALLATION

- A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
- B. 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.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 16 Section 16050 "Basic Electrical Materials and Methods."
- F. Identify and color-code conductors and cables according to Division 16 Section 16050 "Basic Electrical Materials and Methods."

- G. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
- H. Wiring at Outlets: Install conductor at each outlet, with at least 6 inches (150 mm).

3.3 FIELD QUALITY CONTROL

- A. Testing: Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.
- B. Test Reports: Prepare a written report to record the following:
 - 1. Test procedures used.
 - 2. Test results that comply with requirements.
 - 3. Test results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

END OF SECTION 16120

SECTION 16130 RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
- B. See Division 16 Section 16050 "Basic Electrical Materials and Methods" for supports, anchors, and identification products.
- C. See Division 16 Section 16071 "Seismic Controls for Electrical Work" for seismic restraints and bracing of raceways, boxes, enclosures, and cabinets.
- D. See Division 16 Section 16140 "Wiring Devices" for devices installed in boxes and for floor-box service fittings.

1.2 SUBMITTALS

- A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets indicated.
- B. Shop Drawings: Show fabrication and installation details of components for raceways, fittings, boxes, enclosures, and cabinets.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 METAL CONDUIT AND TUBING

- A. Manufacturers:

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Raceways and Boxes

1. AFC Cable Systems, Inc.
2. Alflec Inc.
3. Anamet Electrical, Inc.; Anaconda Metal Hose.
4. Electri-Flex Co.
5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
6. LTV Steel Tubular Products Company.
7. Manhattan/CDT/Cole-Flex.
8. O-Z Gedney; Unit of General Signal.
9. Wheatland Tube Co.

B. Rigid Steel Conduit: ANSI C80.1.

C. Aluminum Rigid Conduit: ANSI C80.5.

D. IMC: ANSI C80.6.

E. EMT and Fittings: ANSI C80.3.

1. Fittings: Compression type.

F. FMC: Aluminum.

G. LFMC: Flexible steel conduit with PVC jacket.

H. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.3 NONMETALLIC CONDUIT AND TUBING

A. Manufacturers:

1. American International.
2. Anamet Electrical, Inc.; Anaconda Metal Hose.
3. Arnco Corp.
4. Cantex Inc.
5. Certainteed Corp.; Pipe & Plastics Group.
6. Condux International.
7. ElecSYS, Inc.
8. Electri-Flex Co.
9. Lamson & Sessions; Carlon Electrical Products.
10. Manhattan/CDT/Cole-Flex.
11. RACO; Division of Hubbell, Inc.
12. Spiraldut, Inc./AFC Cable Systems, Inc.
13. Thomas & Betts Corporation.

B. RNC: NEMA TC 2, Schedule 40 and Schedule 80 PVC.

C. RNC Fittings: NEMA TC 3; match to conduit or tubing type and material.

- D. LFNC: UL 1660.

2.4 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers:

1. Cooper Crouse-Hinds; Div. of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Erickson Electrical Equipment Co.
4. Hoffman.
5. Hubbell, Inc.; Killark Electric Manufacturing Co.
6. O-Z/Gedney; Unit of General Signal.
7. RACO; Division of Hubbell, Inc.
8. Robroy Industries, Inc.; Enclosure Division.
9. Scott Fetzer Co.; Adalet-PLM Division.
10. Spring City Electrical Manufacturing Co.
11. Thomas & Betts Corporation.
12. Walker Systems, Inc.; Wiremold Company (The).
13. Woodhead, Daniel Company; Woodhead Industries, Inc. Subsidiary.

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

D. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

E. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

F. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Nonmetallic Enclosures: Plastic, finished inside with radio-frequency-resistant paint.

G. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

2.5 FACTORY FINISHES

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Raceways and Boxes

- A. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard prime-coat finish ready for field painting.
- B. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard paint applied to factory-assembled surface raceways, enclosures, and cabinets before shipping.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Outdoors:
 - 1. Exposed: Rigid steel.
 - 2. Concealed: Rigid steel or IMC.
 - 3. Underground, Single Run: Pabco wrapped rigid steel.
 - 4. Underground, Grouped: RNC.
 - 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - 6. Boxes and Enclosures: NEMA 250, Type 3R.
- B. Indoors:
 - 1. Exposed: EMT.
 - 2. Concealed: EMT.
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
 - 4. Damp or Wet Locations: Rigid steel conduit.
 - 5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
 - a. Damp or Wet Locations: NEMA, Type 4.
- C. Minimum Raceway Size 3/4-inch trade size (DN 21).
- D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.
 - 2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings approved for use with that material. Patch all nicks and scrapes in PVC coating after installing conduits.
- E. Install nonferrous conduit or tubing for circuits operating above 60 Hz. Where aluminum raceways are installed for such circuits and pass through concrete, install in nonmetallic sleeve.
- F. Do not install aluminum conduits embedded in or in contact with concrete.

3.2 INSTALLATION

- A. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- B. Complete raceway installation before starting conductor installation.
- C. Support raceways as specified in Division 16 Section 16050 "Basic Electrical Materials and Methods."
- D. Install temporary closures to prevent foreign matter from entering raceways.
- E. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above finished slab.
- F. Make bends and offsets so ID is not reduced. Keep legs of bends in same plane and keep straight legs of offsets parallel, unless otherwise indicated.
- G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
 - 1. Install concealed raceways with a minimum of bends in shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.
- H. Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches (50 mm) of concrete cover.
 - 1. Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
 - 2. Space raceways laterally to prevent voids in concrete.
 - 3. Run conduit larger than 1-inch trade size (DN 27) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
 - 4. Change from nonmetallic tubing to Schedule 80 nonmetallic conduit, rigid steel conduit, or IMC before rising above floor.
- I. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
 - 1. Run parallel or banked raceways together on common supports.
 - 2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- J. Join raceways with fittings designed and approved for that purpose and make joints tight.

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Raceways and Boxes

1. Use insulating bushings to protect conductors.
 - K. Tighten set screws of threadless fittings with suitable tools.
 - L. Terminations:
 1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
 2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
 - M. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.
 - N. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-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. Install raceway sealing fittings at the following points:
 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where otherwise required by NFPA 70.
 - O. Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.
 - P. Flexible Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.
 - Q. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.
 - R. Install hinged-cover enclosures and cabinets plumb. Support at each corner.
- 3.3 PROTECTION

- A. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 16130

SECTION 16140 WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Single and duplex receptacles, ground-fault circuit interrupters, and integral surge suppression units.
 - 2. Single- and double-pole snap switches.
 - 3. Device wall plates.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated.
- 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.
- D. Field quality-control test reports.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Wiring Devices:
 - a. Bryant Electric, Inc./Hubbell Subsidiary.
 - b. Eagle Electric Manufacturing Co., Inc.
 - c. Hubbell Incorporated; Wiring Device-Kellems.
 - d. Leviton Mfg. Company Inc.

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Wiring Devices

- e. Pass & Seymour/Legrand; Wiring Devices Div.

2.2 RECEPTACLES

- A. Straight-Blade-Type Receptacles: Comply with NEMA WD 1, NEMA WD 6, DSCC W-C-596G, and UL 498.
- B. Straight-Blade and Locking Receptacles: Heavy-Duty grade.
- C. Straight-Blade Receptacles: Hospital grade.
- D. GFCI Receptacles: Straight blade, non-feed-through type, Heavy-Duty grade, with integral NEMA WD 6, Configuration 5-20R duplex receptacle; complying with UL 498 and UL 943. Design units for installation in a 2-3/4-inch- (70-mm-) deep outlet box without an adapter.

2.3 SWITCHES

- A. Single- and Double-Pole Switches: Comply with DSCC W-C-896F and UL 20.
- B. Snap Switches: General-Duty grade, quiet type.
- C. Combination Switch and Receptacle: Both devices in a single gang unit with plaster ears and removable tab connector that permit separate or common feed connection.
 - 1. Switch: 20 A, 120/277-V ac.
 - 2. Receptacle: NEMA WD 6, Configuration 5-15R.

2.4 WALL PLATES

- A. Single and combination types to 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 0.035-inch- (1-mm-).
 - 3. Material for Unfinished Spaces: Galvanized steel.
 - 4. Material for Wet Locations: Cast aluminum with spring-loaded lift cover, and listed and labeled for use in "wet locations."

2.5 FINISHES

- A. Color:
 - 1. Wiring Devices: Ivory , unless otherwise indicated or required by NFPA 70

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install devices and assemblies level, plumb, and square with building lines.
- B. 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.
- C. Remove wall plates and protect devices and assemblies during painting.

3.2 IDENTIFICATION

- A. Comply with Division 16 Section 16050 "Basic Electrical Materials and Methods."
 - 1. Receptacles: Identify panelboard and circuit number from which served. Use hot, stamped or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.

3.3 CONNECTIONS

- A. Ground equipment according to Division 16 Section 16060 "Grounding and Bonding."
- B. Connect wiring according to Division 16 Section 16120 "Conductors and Cables."

3.4 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports:
 - 1. After installing wiring devices and after electrical circuitry has been energized, test for proper polarity, ground continuity, and compliance with requirements.
 - 2. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
- B. Remove malfunctioning units, replace with new units, and retest as specified above.

END OF SECTION 16140

SECTION 16145 LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Photoelectric relays.
2. Occupancy sensors.
3. Multipole lighting contactors.
4. Timeclocks.

1.2 SUBMITTALS

- A. Product Data: For each type of lighting control device indicated.
- B. Field quality-control test reports.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in the current approved edition of CEC, Article 100, by a testing agency acceptable to the State's Representative, and marked for intended use.
- B. Comply with 47 CFR 15, Subparts A and B, for Class A digital devices.
- C. Comply with NFPA 70, CEC and NEC.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
1. Contactors:
 - a. Dayton Electric Manufacturing Co
 - b. Automatic Switch Co.
 - c. Challenger Electrical Equipment Corp.
 - d. Cutler-Hammer Products; Eaton Corporation.

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Lighting Control Devices

- e. Furnas Electric Co.
- f. GE Lighting Controls.
- g. Hubbell Lighting, Inc.
- h. Siemens Energy and Automation, Inc.
- i. Square D Co.; Power Management Organization.
- j. Zenith Controls, Inc.
- 2. Photoelectric Relays:
 - a. Allen-Bradley/Rockwell Automation.
 - b. Area Lighting Research, Inc.
 - c. Fisher Pierce.
 - d. Grasslin Controls, Corp.
 - e. Intermatic, Inc.
 - f. Paragon Electric Co., Inc.
 - g. Rhodes, M H, Inc.
 - h. SSAC, Inc.
 - i. Tork, Inc.
- 3. Occupancy Sensors:
 - a. Honeywell, Inc.; Home and Building Controls.
 - b. Hubbell Lighting, Inc.
 - c. Leviton Lighting Control Division
 - d. Lightolier.
 - e. Lithonia Control Systems.
 - f. MyTech Corporation.
 - g. Novitas, Inc.
 - h. RAB Electric Manufacturing Co., Inc.
 - i. SenTec, Inc.
 - j. Sterner Lighting Systems, Inc.
 - k. Tork, Inc.
 - l. Touchplate.
 - m. Unenco Electronics (A Hubbell Co.).
 - n. Watt Stopper, Inc. (The).
- 4. Timeclocks:
 - a. Honeywell Inc.; Home and Building Controls
 - b. Leviton Lighting Control Division
 - c. Lithonia Control Systems
 - d. MyTech Corporation
 - e. Paragon
 - f. Tork, Inc.
 - g. Watt Stopper, Inc (The)

2.2 GENERAL LIGHTING CONTROL DEVICE REQUIREMENTS

- A. Line-Voltage Surge Protection: Include in all 120 solid-state equipment. Comply with UL 1449 and with ANSI C62.41 for Category A locations.

2.3 PHOTOELECTRIC RELAYS

- A. Outdoor Sealed Units: Solid state, with single-pole, double-throw dry contacts rated to operate connected relay or contactor coils or microprocessor input, and complying with UL 773A Weathertight housing, resistant to high temperatures and equipped with sun-glare shield and ice preventer.
 - 1. Light-Level Monitoring Range: 0 to 3500 fc, with an adjustment for turn-on/turn-off levels.
 - 2. Time Delay: Prevents false operation.

2.4 OCCUPANCY SENSORS

- A. Ceiling Mounted Units: Dual technology ultrasonic and passive infrared type with adjustable 5 minute to 30 minute time delay and 360 degrees of coverage Unit power directly from switch leg of the 120- V ac circuit it controls and operates integral power switching contacts rated 800 W at 120-V ac minimum.
- B. Wall Mounted Units: Infrared type with adjustable off time delay from 30 seconds to 30 minutes and provide 20% to 100% adjustable unit sensitivity. Unit power directly from switch leg of the 120- V ac circuit it controls and operates integral power switching contacts rated 800 W at 120-V ac minimum.
- C. Operation: Turns lights on when room or covered area is occupied and off when unoccupied, unless otherwise indicated.
 - 1. Time Delay for Turning Lights Off: Adjustable over a range from 1 to 15 minutes, minimum.
 - 2. Ambient-Light-Level Control: Adjustable for setting a level of ambient illumination above which sensor will not turn lights on when occupancy is sensed.
- D. Passive-Infrared Type: Detects occupancy by a combination of heat and movement in zone of coverage. Each sensor detects occupancy anywhere in an area of 500 sq. ft. by detecting movement of any portion of a human body that presents a target to the sensor.

2.5 TIMECLOCKS

- A. Furnish and Install where noted on the plans a single channel digital time switch.
- B. Timeclock shall program in am/pm or 24 hour format by jumper selection.
- C. Timeclock shall program in one minute resolution.
- D. Timeclock shall program using 2 buttons only for all its basic settings.

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Lighting Control Devices

- E. Display shall be LCD type.
- F. Timeclock shall be capable of 48 events per week with separate scheduling for each day of the week.
- G. Timeclock shall have 365 day holiday capabilities with 16 single dates and 5 holiday blocks or unlimited utilizing 8th and 9th day schedules.
- H. Timeclock shall have user selectable daylight saving or standard time.
- I. Timeclock shall have automatic leap year correction.
- J. Timeclock shall have 72 hour memory backup with rechargeable battery.
- K. Timeclock shall be capable of manual override on or off to the next scheduled event using 1 button.
- L. Description: Solid-state programmable type with astronomic dial and alphanumeric display complying with UL 917. Tork model 'DWZ100A' or approved equal

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Mounting heights indicated are to bottom of unit for suspended devices and to center of unit for wall-mounting devices.
- B. Bundle, train and support wiring in enclosures.

3.2 IDENTIFICATION

- A. Identify components and power and control wiring according to Division 16 Section "Basic Electrical Materials and Methods."

3.3 FIELD QUALITY CONTROL

- A. Inspect components for defects and physical damage, testing laboratory labeling, and nameplate compliance with the Contract Documents.
- B. Electrical Tests: Use particular caution when testing devices containing solid-state components. Perform the following according to manufacturer's written instructions:
 - 1. Continuity tests of circuits.
 - 2. Operational Tests: Set and operate devices to demonstrate their functions and capabilities in a methodical sequence that cues and reproduces

actual operating functions. Record control settings, operations, and functional observations.

3. Correct deficiencies, make necessary adjustments, and retest. Verify that specified requirements are met.

3.4 DEMONSTRATION

- A. Engage a factory-authorized service representative to train the State's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 16145

SECTION 16410 DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes individually mounted enclosed switches and circuit breakers, rated 600 V and less, used for disconnecting and protection functions.

1.2 SUBMITTALS

- A. Product Data: For each type of switch and circuit breaker indicated.
- B. Field quality-control test reports.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Source Limitations: Obtain switches and circuit breakers through one source from a single manufacturer.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Eaton Corp.; Cutler-Hammer Products.
 - 2. General Electric Co.; Electrical Distribution & Control Division.
 - 3. Siemens Energy & Automation, Inc.
 - 4. Square D Co.
- B. For circuit breakers to be installed into existing distribution equipment and panelboards, match existing.

2.2 ENCLOSED SWITCHES

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Disconnect Switches

- A. Enclosed, Nonfusible Switch: NEMA KS 1, Type HD, with lockable handle, interlocked with cover.
- B. Enclosed, Fusible Switch, 800 A and Smaller: NEMA KS 1, Type HD, with clips to accommodate specified fuses, and lockable handle, interlocked with cover.

2.3 ENCLOSED CIRCUIT BREAKERS

- A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current 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.
 - 2. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.
- B. Molded-Case Circuit-Breaker Features and Accessories: Standard frame sizes, trip ratings, and number of poles.
 - 1. Lugs: Suitable for number, size, trip ratings, and material of conductors.
 - 2. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
 - 3. Ground-Fault Protection: Integrally mounted relay and trip unit with adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator.

2.4 ENCLOSURES

- A. Listed for environmental conditions of installed locations, including:
 - 1. Outdoor Locations: NEMA 250, Type 3R.
 - 2. Food Service Areas: NEMA 250, Type 4X, stainless steel.
 - 3. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Temporary Provisions: Remove temporary lifting provisions and blocking of moving parts.

- B. Identify components; provide warning signs as specified in Division 16 Section 16050 "Basic Electrical Materials and Methods."

3.2 FIELD QUALITY CONTROL

- A. Testing: After installing disconnect switches and circuit breakers and after electrical circuits have been energized, demonstrate product capability and compliance with requirements.
- B. Inspections and Tests for Switches and Circuit Breakers: Make internal and external inspections and perform tests, including the following:
 - 1. Inspect for freedom from physical damage, proper unit rating, mechanical condition, enclosure integrity, cover operation, unit anchorage, clearances, and tightness of electrical connections. If a loose electrical connection is observed on any unit, check each electrical connection for each switch and circuit breaker with a torque wrench for compliance with manufacturer's torquing instructions.
 - 2. Test insulation resistance of each pole, phase-to-phase, and phase-to-ground, following manufacturer's written instructions. Test insulation resistance of shunt trip circuits. Use 500-V minimum test voltage for units and circuits rated up to 250 V, 1000-V minimum test voltage for units rated more than 250 V. Measured insulation resistance must be 25 megohms, minimum, for switches rated up to 250 V, and 100 megohms, minimum, for switches rated more than 250 V.
 - 3. Test cover and other interlocks and interlock release devices for proper operation.
- C. Additional Inspections and Tests for Switches: Include the following:
 - 1. Inspect for proper rating and fuse provisions.
 - 2. Check adequacy and integrity of fuseholders by removing and installing fuses.
 - 3. Check integrity of phase barriers.
 - 4. Inspect blade alignment visually while operating switch to observe adequacy of blade pressure.
- D. Additional Inspections and Tests for Circuit Breakers: Include the following:
 - 1. Inspect for proper frame, trip, and fault current interrupting rating.
 - 2. Test shunt trip devices, circuits, and actuating components for proper operation.

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Disconnect Switches

- E. Correct defective and malfunctioning units on-site, where possible, and reinspect and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 16410

SECTION 16442 PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes distribution and branch-circuit panelboards.

1.2 SUBMITTALS

- A. Product Data: For each type of overcurrent protective device, accessory, and component indicated.
- B. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.
- C. Field quality-control test reports.
- D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NEMA PB 1.
- C. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- 1. Manufacturers: Match existing.

2.2 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents.
 - 1. Thermal-Magnetic Circuit Breakers: Inverse time-current 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.
 - 2. GFCI Circuit Breakers: Single- and two-pole configurations with 5-mA trip sensitivity.

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Panelboard

3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
- B. Fused Switch: NEMA KS 1, Type HD; clips to accommodate indicated fuses; lockable handle.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboard accessories according to NEMA PB 1.1.
- B. Install filler plates in unused protective device spaces.
- C. Wiring in Panelboards: Arrange conductors into groups and bundle and wrap with wire ties after completing load balancing.

3.2 IDENTIFICATION

- A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Division 16 Section "Basic Electrical Materials and Methods and Electrical Identification."
- B. Panelboard Nameplates: Label each panelboard with engraved metal or laminated-plastic nameplate mounted with corrosion-resistant screws.
- C. Circuit Directory: Create a directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

3.3 FIELD QUALITY CONTROL

- A. Testing and Inspection: After installing overcurrent devices and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.
 1. Procedures: Perform each electrical test and visual and mechanical inspection indicated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers.
 2. Correct defective and malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
- B. Balancing Loads: After Substantial Completion, but not more than 60 days after Final Acceptance, measure load balancing and make circuit changes as follows:

1. Measure as directed during period of normal system loading.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility and at time directed. Avoid disrupting critical 24-hour services such as fax machines and on-line data-processing, computing, transmitting, and receiving equipment.
3. After circuit changes, recheck loads during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as necessary to meet this minimum requirement.

END OF SECTION 16442

SECTION 16511 LIGHTING FIXTURES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Interior lighting fixtures with lamps and ballasts.
 - 2. Lighting fixtures mounted on exterior building surfaces.

1.2 SUBMITTALS

- A. Product Data: For each type of lighting fixture scheduled, arranged in order of fixture designation. Include data on features, accessories, and finishes.
- B. Shop Drawings: Show details of nonstandard or custom fixtures. Indicate dimensions, weights, methods of field assembly, components, features, and accessories.
 - 1. Include wiring diagrams.
- C. Operation and maintenance data.

1.3 QUALITY ASSURANCE

- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
 - 1. Products: Subject to compliance with requirements, provide one of the products specified.

2.2 LIGHTING FIXTURES

- A. Fixture Schedules:
 - 1. Products:
 - a. As noted in fixture schedule.

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Lighting Fixtures

2. Voltage: 120-V ac.
3. Mounting: Surface wall.
4. Lamps: As noted on plans.
5. Ballast Types and Features: Electronic, Low temperature.

2.3 FLUORESCENT LAMP BALLASTS

- A. Description: Include the following features, unless otherwise indicated:
1. Designed for type and quantity of lamps indicated at full light output.
 2. Externally fused with slow-blow type rated between 2.65 and 3.0 times the line current.
- B. Ballasts for compact lamps in recessed fixtures shall have the following features, unless otherwise indicated:
1. Type: Electronic.
 2. Power Factor: 90 percent, minimum.
 3. Flicker: Less than 5 percent.
 4. Lamp Current Crest Factor: Less than 1.7.
 5. Electronic Ballast Operating Frequency: 20 kHz or higher.
 6. Lamp end-of-life detection and shutdown circuit.
 7. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.
- C. Ballasts for compact lamps in nonrecessed fixtures shall include the following features, unless otherwise indicated:
1. Power Factor: 90 percent, minimum.
 2. Ballast Coil Temperature: 65 deg C, maximum.
 3. Transient Protection: Comply with IEEE C62.41 for Category A1 locations.

2.4 FLUORESCENT LAMPS

- A. Compact Fluorescent Lamps: CRI 80 (minimum), color temperature 3500 , average rated life of 10,000 hours at 3 hours operation per start, unless otherwise indicated.
1. T4, Twin Tube: Rated 5 W, 250 initial lumens (minimum).
 2. T4, Twin Tube: Rated 7 W, 400 initial lumens (minimum).
 3. T4, Twin Tube: Rated 9 W, 600 initial lumens (minimum).
 4. T4, Twin Tube: Rated 13 W, 825 initial lumens (minimum).
 5. T4, Double-Twin Tube: Rated 13 W, 900 initial lumens (minimum).
 6. T4, Double-Twin Tube: Rated 18 W, 1200 initial lumens (minimum).
 7. T4, Double-Twin Tube: Rated 26 W, 1800 initial lumens (minimum).

2.5 FIXTURE SUPPORT COMPONENTS

- A. Comply with Division 16 Section 16050 "Basic Electrical Materials and Methods" for channel- and angle-iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.

END OF SECTION 16511