

Contract Documents and Construction Specifications

Grace Way Well Project Site Improvements



**SCOTTS VALLEY
WATER DISTRICT**

svwd.org  svwater

Scotts Valley Water District
Santa Cruz County, California

June 2025

Project Engineer: C2G/Civil Consultants Group, Inc.

SECTION 1 BID DOCUMENTS

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1-A NOTICE INVITING BIDS**SCOTTS VALLEY WATER DISTRICT****GRACE WAY WELL – SITE IMPROVEMENTS**

Date Issued: June 23rd, 2025

Date Published June 23rd, , 2025

Notice is hereby given that sealed bids will be received by the Scotts Valley Water District (“District”) in the District Office at the time, date and place below for furnishing all labor, materials, tools, supplies, equipment, transportation, appurtenances and services for completing the installation, development and testing of project designated by the Scotts Valley Water District as GRACE WAY WELL - SITE IMPROVEMENTS at which time and place bids will be publicly opened and read.

Location: Scotts Valley Water District
2 Civic Center Drive, Scotts Valley CA 95066

Time: **Before 2:00 PM, Tuesday July 22nd**

After bids are opened, they will be referred to staff for subsequent action. The District reserves the right to reject any or all bids and to waive any errors or discrepancies. Any bids received after the scheduled closing time for receipt of bids will be returned unopened.

GRACE WAY WELL - SITE IMPROVEMENTS DESCRIPTION

The GRACE WAY WELL – SITE IMPROVEMENTS involves the furnish of all materials, labor, equipment, fuel, tools, transportation, and service for the installation of new pipeline, pavement, fencing, drainage and housing for the motor control center associated with the new well. Grace Way Well site is located at 5297 Scotts Valley Drive.

REQUIREMENTS**Contractor's License**

To submit a bid the Contractor must possess licenses valid in the State of California for **Class -A General Engineering License or Class-34 Pipeline** Contractor’s License. In accordance with the provisions of California Business and Professions Code Section 7028.15, a bid submitted to the

District by a Contractor who is not licensed in accordance with applicable laws shall be considered non-responsive.

Time Limit for Completion

The successful bidder will have 120 calendar days to substantially complete the GRACE WAY WELL - SITE IMPROVEMENTS from the Notice to Proceed. Liquidated Damages in the amount of \$560 per day will be assessed for each calendar day the work remains incomplete beyond the time fixed above for completion pursuant to Section 2-F, Special Conditions, and Liquidated Damages.

Prevailing Wage and Labor Code Compliance

The District hereby advises all bidders that the successful bidder shall: (a) Employ the appropriate number of apprentices on the job site as set forth in California Labor Code 1777.5; (b) Provide Workers' Compensation coverage, as set forth in California Labor Code Sections 1860 and 1861; (c) Keep and maintain the records of work performed on the public works Grace Way Well Site, as set forth in California Labor Code Section 1812; (d) Keep and maintain the records required under California Labor Code Section 1776 which shall be subject to inspection pursuant to California Labor Code Section 1776 and California Code of Regulations, Division 1, Chapter 8, Subchapter 3, Article 6, Section 16400(e); (e) Be subject to other requirements imposed by law; and (f) pay prevailing wages as required by Labor Code Sections 1770, 1773, 1773.1, 1773.6 and 1773.7 as amended.

Notice of Public Works Registration

Notice is hereby given that no contractor or subcontractor may be listed on a bid proposal for a public works **Grace Way Well Site Improvements** unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5, with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a). No contractor or subcontractor may be awarded a contract for public work on a public works Grace Way Well Site unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This **Grace Way Well - Site Improvements** is subject to compliance monitoring and enforcement by the Department of Industrial Relations. All contractors and subcontractors must furnish electronic certified payroll records directly to the Labor Commissioner (aka Division of Labor Standards Enforcement) if required by law.

OBTAINING DOCUMENTS

Electronic copies of all Contract Documents are available per request. All prospective bidders shall register with the District by calling 831-438-2363 or emailing engineering@svwd.org. The Contract Documents are also available on District website www.svwd.org.

CONTACT INFORMATION

Pre-Bid Inquiries. Bidders may submit pre-bid inquiries or clarification requests. Bidders are solely and exclusively responsible for submitting such inquiries or clarification requests not less than Fourteen (14) days prior to the scheduled closing date for the receipt of Bid Proposals. The District will not respond to any bidder inquiries or clarification requests unless such inquiries or clarification requests are timely submitted.

QUESTIONS CONCERNING THIS GRACE WAY WELL SITE IMPROVEMENTS SHOULD BE SUBMITTED TO THE OWNER'S REPRESENTATIVE:

Scotts Valley Water District

2 Civic Center Drive

Scotts Valley, CA 95066

Attn: Nate Gillespie, Operations Manager

ngillespie@svwd.org

END OF DOCUMENT

1-B INSTRUCTION TO BIDDERS**SCOTTS VALLEY WATER DISTRICT****GRACE WAY WELL - SITE IMPROVEMENTS****GENERAL**

The work to be performed is described in the Bid Documents and Plans, Drawings and Specifications titled GRACE WAY WELL – SITE IMPROVEMENTS. All bidders shall carefully examine the Contract Documents and satisfy themselves as to their sufficiency. Prior to submission of a bid, the bidder shall notify the District of any conflicts, errors or discrepancies in the Contract Documents prior to the submission of its bid. Intended bidders shall have visited the site of the work and familiarized themselves with the conditions there existing as well as all other conditions relating the construction and labor under which the work will be performed and affecting cost, progress or performance of the work. The submission of a bid shall be considered an acknowledgment on the part of the Bidder of its familiarity with conditions at the site of work.

PRE-BID CONFERENCE

A pre-bid conference will not be needed for this project.

POSTPONEMENT OF BID OPENING

The District reserves the right to postpone the date and time for receiving and/or opening of bids at any time prior to the date and time established in the Notice Inviting Bids.

Postponement notices may be faxed or emailed and will subsequently be mailed to registered plan holders of record in the form of addenda.

INTERPRETATIONS

No oral representations or interpretations will be made to any bidder as to the meaning of the Contract Documents. Requests for an interpretation shall be made in writing and delivered to the District's Representative at least fourteen (14) days before the bids are opened.

ADDENDA

Addenda may be issued to all known plan holders during the Bid period. Any and all addenda issued shall become a part of the Contract Documents shall be acknowledged on the Bid Form, and shall be fully considered by all bidders during their preparation of bids.

SUBSTITUTIONS

No Substitutions will be allowed for this project.

REQUIRED BID FORMS

Bids for the work shall be made on the forms contained in the section and shall include the following completed documents:

1-C Bid Form

1-D Bid Bond (or use form supplied by bonding company)

1-E Subcontractors List

1-F Statement of Qualifications

1-G Non-Collusion Affidavit

1-H Bidder Certifications

1-I Iran Contracting Act Certification

BID SUBMISSION

Before the deadline for the submission of bids, a complete set of bid forms listed above, shall be placed in an envelope, sealed, and addressed to the Owner's Representative:

Nate Gillespie, Operations Manager
Scotts Valley Water District
2 Civic Center Drive, Scotts Valley CA 95066

The envelope shall reflect the name of the project: Grace Way Well & Building Demolition. Bids shall give the prices proposed in figures and words, shall give all other information requested herein, and shall be signed by the bidder or an authorized representative. By submission of a bid, the bidder certifies that the bidder has obtained a complete set of the Contract Documents and is aware of the entire contents thereof, including all addenda.

BID OPENING

After the expiration of the time for submission of bids, all bids will be publicly opened, read, declared, and referred to staff for action.

MODIFICATION OF BIDS

Modification of a bid already received will be considered only if the modification is received prior to the time established for receiving bids.

WITHDRAWAL OF BID

Any bid may be withdrawn prior to the time established for receiving bids, provided that a written request for withdrawal of bids, executed by the bidder or his duly authorized representative, is filed with the District. The bid will be considered null and void and will be returned to the Contractor unopened. The withdrawal of a bid in such a manner will not prejudice the right of a bidder to file a new bid prior to the time established for receiving bids.

BID FORM

The Bid shall be submitted on Form 1-C-Bid Form.

BID PRICES

Bid prices shall include everything necessary for the completion of construction and fulfillment of the work described in the Contract Documents. Bid prices shall include all federal, state and local taxes including sales and use taxes. Costs for developing, submitting, and presenting bids are the sole responsibility of the bidder.

BID BOND

Bids shall be accompanied by a cashier's check, a certified check or a bidder's bond executed by an admitted surety in an amount not less than ten (10) percent of the aggregate of the bid amount, payable to the order of the District. The check or bond shall be a guarantee that the successful bidder, if awarded the work, will within ten (10) days after notice of its award to the successful bidder: (1) enter into a contract, (2) furnish a bond of faithful performance and a bond, (3) furnish insurance policies and endorsements and (4) prior to issuance of the final Grace Way Well Construction and Building Demolition payment the successful bidder must submit a warranty or maintenance bond. In case of refusal or failure to enter into the Contract, the bid guaranty check or bond, as the case may be, shall be forfeited to the District, the proceeds therefrom being hereby agreed upon as liquidated damages to the District on account

of the delay in the execution of the Contract and required bonds and the performance of the work thereunder, and the necessity of accepting a higher or less desirable bid resulting from such failure or refusal to execute the Contract and the bonds as required. Upon the execution of the Contract and the approval on behalf of the District of the accompanying bonds and insurance policies and endorsements, all certified checks that accompany bids and that have not heretofore been returned will be returned, each to its maker. Form 1-D Bid Bond Form

SUBCONTRACTORS

In accordance with California Public Contracting Code Section 4100, et. seq., each bid shall have listed the name, type or trade, portion of work to be performed, and location of the place of business of each subcontractor who will perform work or labor or render service to the bidder in or about the construction of the work or improvement, or of any subcontractor licensed by the State of California who, under subcontract to the bidder, will specifically fabricate and install a portion of the work or improvement according to detailed drawings contained in the Bid Documents, in an amount in excess of one-half of one percent of the bidder's total bid or \$10,000, whichever is greater. If the Contractor fails to designate in its proposal a subcontractor for any portion of the work as required above, the bidder shall be deemed to have agreed to perform such portion of the work itself and shall not be permitted to subcontract that portion of the work without the written permission of the District in accordance with applicable law. Form 1-E-Subcontractors List

BIDDER CERTIFICATIONS

The Contractor shall complete and submit with its bid the Statement of Qualifications Form 1-F – Statement of Qualifications

NON-COLLUSION AFFIDAVIT

In accordance with Public Contract Code Section 7106, the Contractor shall complete and file with its bid the Non-Collusion Affidavit. Form 1-G Non-Collusion Affidavit

BIDDER CERTIFICATIONS

The Contractor shall complete and submit with its bid the Bidder Certifications Form 1-H -- Bidder Certifications

Iran Contracting Certification

The Contractor shall complete and submit with its bid the Iran Contracting Certification Form 1-I – Iran Contracting Act Certification

BID IRREGULARITIES

Bids which contain omissions or material irregularities of any kind may be rejected. No oral, telegraphic, facsimile or telephonic bids or modifications will be considered. The District may, however, waive any irregularities in the bid process.

AWARD

If an award is made, it will be based on the lowest responsive, responsible bid.

INSURANCE, PAYMENT BOND, AND PERFORMANCE BOND

The successful bidder shall, within ten (10) days of the notice of award, provide the insurance, and the payment and performance bonds as required in Section 4-of the Contract Award Documents.

LOCAL BUSINESS LICENSE

All Contractors shall have a local business license before performing work on the Grace Way Well Site with the City of Scotts Valley.

END OF DOCUMENT

1-C BID FORM**SCOTTS VALLEY WATER DISTRICT****GRACE WAY WELL – SITE IMPROVEMENTS**

Contractor: _____

Business Address: _____

Phone: _____ Email: _____

Contractor License: _____ Class: _____ Expiration
Date: _____

DIR Registration _____

Pursuant to the Notice Inviting Bids, and in compliance with the Instructions to Bidders, having obtained and reviewed the Contract Documents and the Grace Way Well – Site Improvements, the undersigned hereby proposes to furnish all work, labor, materials, transportation, equipment, and services necessary, including State of California and local sales or use taxes, license, and permit fees, for the Scotts Valley Water District SITE IMPROVEMENTS OF GRACE WAY WELL, all in accordance with the Contract Documents together with addenda issued prior to or at the time of bidding, if any, now on file with the District Representative, for the sum of:

Bid Schedule – Grace Way Well – Site Improvements

Item No.	Description	Payment Reference	Unit	EST. QTY.	Unit Price	Extended Price
1	Mobilization	§3-A.01 G	LS	1		\$
2	Safety Plan - Trenching	§3-A.04 E	LS	1		\$
3	Traffic Control – Public Right-of-Way	§3-A.05 J(1)	LS	1		\$
4	Erosion Control	§3-A.06 E	LS	1		\$
5	Utility Potholing	Site Clearing - 1.03F	LS	1		\$
6	Well piping/Connection to SVWD	§3-B.02 F(1)	LF	110		\$
7	AC Pavement – Heavy Duty	§3-D.12 E	SQFT	3,200		\$
8	AC Pavement – Standard	§3-D.12 E	SQFT	4,300		\$
9	Storm Improvements	STORM - 1.2	LS	1		\$
10	Sanitary Improvements	SANITARY-1.3	LS	1		\$
11	Minor Concrete Structures	§3-D.15 A	LS	1		\$
12	Well Control Building	-----	LS	1		\$
13	Bio-Retention Installation	Bio-Ret 1.04	LS	1		\$
14	Landscape Material & Planting	Planting 1.2B	LS	1		
15	Landscape Irrigation	Plant Irr 1.2B	LS	1		
16	Chain-link Fencing	§3-D.21C(6)	LF	400		\$
17	Ornamental Fencing/Elect. Gate Entry	Ornamental – 1.3 Payment	LF	70		\$
18	Electrical conduit	Conduit 1.01A	LS	1		\$
Total Bid Price					\$	

 \$

(Written total of Contact Bid)

All bid entries must be filled in.

Addenda Received and Reviewed:

(Indicate with check marks in respective boxes)

Addenda Number and Date

 Reviewed

The undersigned agrees that the enclosed cash deposit, cashier's check, certified check, or surety bond accompanying this bid shall be left on deposit with the District, that its amount is the measure of the liquidated damages which the District will sustain by the default of the undersigned through failure to execute and deliver the above agreement, insurance and bonds within ten (10) calendar days of written notice of the award of the contract and the money or surety bond so deposited by Contractor shall be collectible and become the property of the District in case of such default.

By submission of a bid, a bidder certifies possession of duly issued and valid contractor's license issued by the State of California, which license authorized bidder to contract to perform the type of work required by the Contract Documents. Should the bidder fail to provide below the number and classification of bidder's State of California Contractor's License, the District may reject this bid. Pursuant to Business and Professions Code 7028.15, the undersigned further certifies, under penalty of perjury under the laws of the State of California, that the representations made herein are true and correct.

Signed: _____

Date: _____

Name: _____

Phone: _____

Email: _____

Signed: _____

Date: _____

Name: _____

Phone: _____

Email: _____

(NOTE TO BIDDERS: No bid shall be valid unless signed by the person making the bid. If the party is an individual, the same shall be signed by the individual; if the party is a partnership, the name of the partnership shall be given and signed by one of the partners; if the party is a corporation, the bid should be signed by the corporation by its properly authorized officer or officers.)

END OF DOCUMENT

1-D BID BOND**TO BE EXECUTED BY BIDDER AND****SUBMITTED WITH BID FORM**

Bid Bond to be 10% of Bid.

KNOW ALL MEN BY THESE PRESENTS: THAT

_____ as Contractor and

_____ as Surety,

hereinafter are jointly and severally held and firmly bound unto the Scotts Valley Water District ("District"), each in the penal sum of ten percent (10%) of the total amount of the bid of the Contractor for the work, this sum not to exceed _____ Dollars of lawful money of the United States to the District, the Contractor and Surety, jointly and severally, bind themselves forever firmly by these presents.

WHEREAS, the Contractor is herewith submitting its bid for the fulfillment of the Grace Way Well Site entitled:

SCOTTS VALLEY WATER DISTRICT, SITE IMPROVEMENTS OF GRACE WAY WELL & BUILDING DEMOLITION

NOW, THEREFORE, the condition of this obligation is such that if the Contractor is awarded the Contract, and if the Contractor within the time specified in the proposal for such Contract enters into, executes and delivers to the District an agreement in the form provided herein complete with evidence of insurance, and if the Contractor within the time specified in the proposal gives to the District the performance bond and the labor and material bond on the forms provided in the Contract Documents for the above-referenced SITE IMPROVEMENTS of Grace Way Well& Building Demolition , then this obligation shall be void; otherwise, the Contractor and Surety will pay unto the District the difference in money between the total amount of the proposal of the Principal and the amount which the District legally contracts with another party to fulfill the contract if the latter amount be in excess of the former, but in no event shall the Surety's liability exceed the penal sum hereof.

AND IT IS HEREBY DECLARED AND AGREED that the Surety shall be liable under this obligation as Contractor and that nothing of any kind or nature whatsoever that will not discharge the Contractor shall operate as a discharge or a release of liability of the Surety.

IT IS FURTHER DECLARED by the Surety herein that it is duly admitted and authorized as a Surety to do business in the State of California.

IT IS HEREBY FURTHER DECLARED AND AGREED that this obligation shall be binding upon and inure to the benefit of the Contractor, and Surety and the District and their respective heirs, executors, administrators, and successors and assigns.

CONTRACTOR

SURETY

Signed: _____

Signed: _____

Name: _____

Name: _____

Title: _____

Title: _____

Note: Surety signature must be notarized

END OF DOCUMENT

1-E SUBCONTRACTORS LIST

Name of Subcontractor and Location of Place of Business	Description of Work	Subcontractor's License No.	DIR Registration Number*

(Bidder to attach additional sheets if necessary)

*Pursuant to Division 2, Part 7, Chapter 1 (commencing with section 1720) of the California Labor Code.

END OF DOCUMENT

1-F NON-COLLUSION AFFIDAVIT

TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID FORM

State of California

County of Santa Cruz

_____(name), being first duly sworn, deposes

and says that he or she is the _____(title)

of _____ (name of 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 or 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.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Name: _____

Date: _____

Title: _____

END OF DOCUMENT

1-G STATEMENT OF QUALIFICATIONS**MINIMUM BIDDER QUALIFICATIONS**

Bidders must be duly licensed in accordance with the California Business & Professions Code and have a history of work performance sufficient to meet the requirements of a responsible bidder in the California Public Contract Code Section 1104.

Bidders must have three (3) years of recent experience in the performance of work similar to the Grace Way Well – Exploratory Borehole.

Bidders must demonstrate successful experience with the type of work for the SITE IMPROVEMENTS of Grace Way Well and Building Demolition, to include, within the past year, completed three (3) Well Sites of a similar nature along with Building Demolition with HazMat complexity with a contract dollar amount of at (i) least 75% of the amount of Bidder's Bid or (ii) 125% of such amount in the aggregate.

Provide at least three (3) references for each similar Grace Way Well SITE IMPROVEMENTS and Building Demolition completed by the contractor which demonstrate successful completion of Exploratory Borehole of a similar nature and complexity to the Grace Way Well Site which is the subject of this bid process:

REFERENCE INFORMATION – Well SITE IMPROVEMENTS

Name of Project Site:	_____
Total Project Well Cost:	_____
Total cost of work:	_____
Performed by bidder:	_____
Date Contract	_____
Awarded:	_____
Owner Name:	_____
Contact Person:	_____
Address:	_____
Phone:	_____
E-mail:	_____

REFERENCE INFORMATION – Well SITE IMPROVEMENTS

Name of Project Site: _____

Total Project Well Cost: _____

Total cost of work: _____

Performed by bidder: _____

Date Contract _____

Awarded: _____

Owner Name: _____

Contact Person: _____

Address: _____

Phone: _____

E-mail: _____

REFERENCE INFORMATION – Well SITE IMPROVEMENTS

Name of Project Site: _____

Total Project Well Cost: _____

Total cost of work: _____

Performed by bidder: _____

Date Contract _____

Awarded: _____

Owner Name: _____

Contact Person: _____

Address: _____

Phone: _____

E-mail: _____

REFERENCE INFORMATION – Building Demolition with Asbestos Abatement

Name of Project Site: _____

Total Project Well Cost: _____

Total cost of work: _____

Performed by bidder: _____

Date Contract _____

Awarded: _____

Owner Name: _____

Contact Person: _____

Address: _____

Phone: _____

E-mail: _____

REFERENCE INFORMATION – Building Demolition with Asbestos Abatement

Name of Project Site: _____

Total Project Well Cost: _____

Total cost of work: _____

Performed by bidder: _____

Date Contract _____

Awarded: _____

Owner Name: _____

Contact Person: _____

Address: _____

Phone: _____

E-mail: _____

REFERENCE INFORMATION – Building Demolition with Asbestos Abatement

Name of Project Site: _____

Total Project Well Cost: _____

Total cost of work: _____

Performed by bidder: _____

Date Contract _____

Awarded: _____

Owner Name: _____

Contact Person: _____

Address: _____

Phone: _____

E-mail: _____

The undersigned contractor hereby certifies it meets the Minimum Bidder Requirements and that the contact information listed above is true, complete and correct. I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Dated: _____

Contractor: _____

END OF DOCUMENT

1-H BIDDER CERTIFICATIONS

TO BE EXECUTED BY ALL BIDDERS AND SUBMITTED WITH BID

The undersigned Bidder certifies to Owner:

STATEMENT OF CONVICTIONS

By my signature hereunder, I hereby swear, under penalty of perjury, that no more than one final, un-appealable finding of contempt of court by a Federal Court has been issued against Bidder within the past two years because of failure to comply with an order of a Federal Court or to comply with an order of the National Labor Relations Board.

CERTIFICATION OF WORKER'S COMPENSATION INSURANCE

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Labor Code Section 3700 of the Labor Code which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that Code, and I will comply with such provisions before commencing the performance of the work of this Contract.

CERTIFICATION OF PREVAILING WAGE RATES AND RECORDS

By my signature hereunder, as the Contractor, I certify that I am aware of the provisions of Labor Code 1773 of the California Labor Code, which requires the payment of prevailing wage on public Grace Way Well Site. Also, that the Contractor and any subcontractors under the Contractor shall comply with California Labor Code 1776, regarding wage records, and with California Labor Code 1777.5, regarding the employment and training of apprentices. It is the Contractor's responsibility to ensure compliance by any and all subcontractors performing work under this Contract.

CERTIFICATION OF COMPLIANCE WITH PUBLIC WORKS CHAPTER OF LABOR CODE

By my signature hereunder, as the Contractor, I certify that I am aware of Labor Code Sections 1777.1 and 1777.7 of the California Labor Code and that Contractor and Subcontractors are eligible to bid and work onSITE IMPROVEMENTS of Grace Way Well & Building Demolition.

CERTIFICATION OF NON-DISCRIMINATION

By my signature hereunder, as the Contractor, I certify that there will be no discrimination in employment with regard to race, color, religion, gender, sexual orientation, age or national origin; that all federal, state, and local directives and executive orders regarding non-discrimination in employment will be complied with; and that the principal of equal opportunity in employment will be demonstrated positively and aggressively.

CERTIFICATION OF NON-DISQUALIFICATION

By my signature hereunder, as the Contractor, I swear, under penalty of perjury, that the below-indicated Bidder, any officer of Bidder, or any employee of Bidder who has a proprietary interest in such Bidder, has never 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 safety regulation, except as indicated on the separate sheet attached hereto entitled "Previous Disqualifications." If a statement of "Previous Disqualifications" is attached, please explain the circumstances.

CERTIFICATION OF ADEQUACY OF CONTRACT AMOUNT

By my signature hereunder, as the Contractor, pursuant to Labor Code Section 2810(a), I certify that, if awarded the Contract based on the undersigned's Bid, the Contract will include funds sufficient to allow the Contractor to comply with all applicable local, state, and federal laws or regulations governing the labor or services to be provided. I understand that Owner will be relying on this certification if it awards the Contract to the undersigned.

CERTIFICATION REGARDING DIR CONTRACTOR / SUBCONTRACTOR REGISTRATION

By my signature hereunder, as the Contractor, I certify that Contractor and all Subcontractors listed on the Subcontractors List are the subject of current and active contractor registrations pursuant to Division 2, Part 7, Chapter 1 (commencing with section 1720) of the California Labor Code. Subcontractors' registration numbers are as indicated on the Subcontractors List.

CERTIFICATION OF BIDDER

By my signature hereunder, as the Contractor, I certify that the foregoing information is true and correct.

Bidder: _____ (Name of Bidder)

Date: _____ (Date)

By: _____ (Signature)

Name: _____ (Print Name)

Title: _____ (title)

END OF DOCUMENT

1-I IRAN CONTRACTING ACT CERTIFICATION

As specified in the INSTRUCTIONS TO BIDDERS, pursuant to Public Contract Code section 2204, each bidder submitting a Bid in which the Total Amount set forth on its Bid Schedule is \$1,000,000 or more must also submit with its bid this IRAN CONTRACTING ACT CERTIFICATION, and the failure to submit the IRAN CONTRACTING ACT CERTIFICATION may render the bid non-responsive.

The undersigned Bidder certifies as follows (check the applicable circumstance):

_____The company submitting the accompanying bid is not on the current list of persons engaged in investment activities in Iran created by the California Department of General Services ("DGS") pursuant to Public Contract Code section 2203(b), and is not a financial institution extending twenty million dollars (\$20,000,000) or more in credit to another person, for 45 days or more, if that other person will use the credit to provide goods or services in the energy sector in Iran and is identified on the current list of persons engaged in investment activities in Iran created by DGS.

_____The company submitting the accompanying bid has previously received written permission from the District, pursuant to subdivision (c) or (d) of Public Contract Code section 2203, to submit a bid. A copy of the written permission from the District is submitted with the accompanying bid.

I, the person signing below, hereby certify that I am duly authorized to execute this certification on behalf of the Company identified below, and that I am aware that Public Contract Code section 2205 establishes penalties for providing false certifications, including civil penalties equal to the greater of \$250,000 or twice the amount of the contract for which the false certification was made; contract termination; and three-year ineligibility to bid on contracts.

Bidder: _____ (Name of Bidder)

Date: _____ (Date)

By: _____ (Signature)

Name: _____ (Print Name)

Title: _____ (title)

END OF DOCUMENT

SECTION 2 PROJECT SPECIFIC PLANS AND SPECIFICATIONS

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2-A DESCRIPTION OF WORK

Work includes the furnishing of all materials, labor, equipment, fuel, tools, supplies, transportation, appurtenances, unless specifically excluded herein – necessary to complete the pipe installation, paving, fencing, motor control center housing, electrical conduit, fencing and landscaping of the Grace Way Well – Site Improvements as described herein.

The well head and electrical work will be done at a later date and are not a part of this contract.

The Contractor will be required to obtain an encroachment permit with the City of Scotts Valley for work within the City Right-of-Way and connection to the City's storm drainage system.

The work site is located as 5297 Scotts Valley Drive and is located within Scotts Valley, California 95066.

END OF DOCUMENT

2-B REPORTS AND INFORMATION ON EXISTING CONDITIONS

No Additional Report or Information on Existing Conditions are provided.

END OF DOCUMENT

2-C CEQA CONDITIONS AND MITIGATION MEASURES

1. Mitigated Negative Declaration – Mitigated Monitoring and Report Program (MMRP)
2. California State Water Resource Control Board – NPDES Permit

END OF DOCUMENT

Appendix F

Mitigation Monitoring and Reporting Program

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F Mitigation Monitoring and Reporting Program

The California Environmental Quality Act (CEQA) requires that when a lead agency adopts a mitigated negative declaration, it shall prepare and adopt a mitigation monitoring and reporting program (MMRP) for all required mitigation measures (CEQA Guidelines Section 15097). This MMRP is intended to be used by Scotts Valley Water District (SVWD) staff, its contractors, and mitigation monitoring personnel to ensure compliance with mitigation measures during project construction and implementation. Mitigation measures identified in this MMRP were developed during the preparation of the Initial Study prepared for the Grace Way Well Project.

The MMRP is provided in Table F-1 and includes all mitigation measures identified in the Initial Study and, for each measure, the party responsible for implementation and implementation timing. The MMRP also includes the SVWD's operational practice applicable to the Project, which would be implemented by the SVWD during Project operation.

Table F-1. Grace Way Well Project Mitigation Monitoring and Reporting Program

Mitigation Measures and Standard Practices	Party Responsible for Implementation	Implementation Timing
MITIGATION MEASURES		
<i>Biological Resources</i>		
MM BIO-1: Pre-Activity Surveys for Nesting Birds. Within 14 days prior to any ground-disturbing activities or vegetation clearing during the nesting season (January 15 to September 15), a qualified biologist or biological monitor shall conduct a pre-activity nesting bird survey of all potential nesting habitat within the Project site, including a 100-foot buffer for passerine species and a 300-foot buffer for raptors. If no active nests are found during this survey, a second and final survey shall be conducted within 48 hours prior to construction to confirm that nests are still absent. If there is a lapse between the survey time and initiation of work activities of 14 days or greater, the nesting bird survey shall be repeated. If active nests are found during the survey, work in that area shall stop and a qualified biologist or biological monitor shall determine an appropriate no-work buffer around the nest based on the activity and species and mark the buffer using flagging, pin flags, lathe stakes, or similar marking method. No work shall occur within the buffer until the young have fledged or the nest(s) are no longer active, as determined by the biologist or biological monitor.	SVWD responsible for hiring qualified biologist to conduct surveys.	Preconstruction survey: Within 14 days prior to the initiation of construction activities, and if no active nests are found, no more than 48 hours prior to the initiation of construction activities.
<i>Cultural and Tribal Cultural Resources</i>		
MM CUL-1: Discovery of Unique Archaeological Resources, Historical Resources of Archaeological Nature, and Subsurface Tribal Cultural Resources. If archaeological resources (sites, features, or artifacts) are exposed during construction activities for the Project, all soil-disturbing work within 100 feet of the find shall immediately stop until a qualified archaeologist meeting the Secretary of the Interior's Professional Qualifications Standards can evaluate the significance of the find. The archaeologist will determine whether additional study is warranted. Should it be required, the archaeologist shall install temporary flagging around a resource to avoid any disturbances from construction equipment. If the resource has potential to be a unique archaeological resource, a historical resource of an archaeological nature, or a subsurface tribal cultural resource, the qualified archaeologist, in consultation with the lead agency, shall prepare a research design and archaeological evaluation plan to assess whether the resource should be considered significant under CEQA criteria. If the resource is determined significant, the lead agency shall provide for preservation in place. If preservation in place is not possible, the qualified archaeologist, in consultation with the lead agency, will prepare a data recovery plan for retrieving data relevant to the site's significance. The data recovery plan shall be implemented prior to, or during, site development (with a 100-foot buffer around the resource). The archaeologist shall also perform appropriate technical analyses, prepare a full written report and file it with the Northwest Information Center, and provide for the permanent curation of recovered materials. The written report will provide new recommendations, which could include, but would not be limited to, archaeological and Native American monitoring for the remaining duration of Project construction.	SVWD responsible for hiring a qualified archaeologist to evaluate the find and, if warranted, prepare the plans.	Include measure in construction specifications and contracts: Prior to construction. Evaluate resources: During construction.

Table F-1. Grace Way Well Project Mitigation Monitoring and Reporting Program

Mitigation Measures and Standard Practices	Party Responsible for Implementation	Implementation Timing
<p>MM CUL-2: Human Remains. In accordance with Section 7050.5 of the California Health and Safety Code, if potential human remains are found, immediately notify the lead agency and the Santa Cruz County Coroner of the discovery. The coroner will decide the nature of the remains within 48 hours of notification. No further excavation or disturbance of the identified material, or any area reasonably suspected to overlie additional remains, can occur until a determination has been made. If the County Coroner determines that the remains are, or are believed to be, of Native American ancestry, the coroner will notify the Native American Heritage Commission within 24 hours. In accordance with California Public Resources Code, Section 5097.98, the Native American Heritage Commission will appoint a Most Likely Descendant (MLD), who will be authorized to provide recommendation to the lead agency regarding the preferred treatment of the remains and any associated objects and/or materials.</p>	SVWD responsible for notifying coroner.	Implementation of measure: During construction.
Geology and Soils		
<p>MM GEO-1: Paleontological Resources Impact Mitigation Program and Paleontological Monitoring. Prior to commencement of any grading activity on site, the Scotts Valley Water District shall retain a qualified paleontologist per the Society of Vertebrate Paleontology (2010) guidelines. The qualified paleontologist shall prepare a Paleontological Resources Impact Mitigation Program (PRIMP) for the Project that shall be consistent with the SVP (2010) guidelines and include the following: preconstruction meeting attendance and worker environmental awareness training; locations where paleontological monitoring is required within the Project site based on construction plans and/or geotechnical reports; procedures for adequate paleontological monitoring and discoveries treatment; and paleontological methods (including sediment sampling for microinvertebrate and microvertebrate fossils), reporting, and collections management. Costs for laboratory and museum curation fees (if fossils are recovered) shall be the responsibility of the Scotts Valley Water District. A qualified paleontological monitor shall be on site during initial rough grading and other significant ground-disturbing activities, including large diameter (two feet or greater) drilling below a depth of five feet below the ground surface. No paleontological monitoring is necessary during ground disturbance within artificial fill, determined to be present. In the event that paleontological resources (e.g., fossils) are unearthed during grading or drilling, the paleontological monitor will temporarily halt and/or divert grading activity to allow recovery of paleontological resources. The area of discovery will be roped off with a 50-foot radius buffer. Once documentation and collection of the find is completed, the monitor will allow grading to recommence in the area of the find.</p>	<p>SVWD responsible for hiring qualified paleontologist to prepare the PRIMP and conduct worker training and monitoring.</p> <p>SVWD responsible for inclusion of paleontological resource protection clauses in construction specifications and contracts.</p>	<p>Include measure in construction specifications and contracts: Prior to construction.</p> <p>PRIMP preparation and worker training: Prior to site grading or excavation.</p> <p>Monitoring: During grading and ground disturbance as specified in the PRIMP.</p>

Table F-1. Grace Way Well Project Mitigation Monitoring and Reporting Program

Mitigation Measures and Standard Practices	Party Responsible for Implementation	Implementation Timing
<i>Hydrology and Water Quality</i>		
<p>MM HYD-1: Implement Stormwater Control During Construction. Erosion control and stormwater pollution prevention best management practices (BMPs) shall be implemented to prevent the discharge of construction waste, sediment, debris, or contaminants during construction activities. BMPs shall include, but would not be limited to, the following:</p> <ul style="list-style-type: none"> ▪ Installation of perimeter sediment controls such as silt fences, fiber or straw rolls, and/or bales along limits of work/construction areas; ▪ Minimizing temporary stockpiling of excavated material, locating stockpiled spoils in areas where it cannot enter the storm drain system, and covering of stockpiled spoils; ▪ Revegetation and physical stabilization of disturbed graded and staging areas; ▪ Sediment control including fencing, dams, barriers, berms, traps, and associated basins; ▪ Wind erosion controls such as watering active construction areas as necessary to control fugitive dust, covering inactive storage piles, and covering all trucks hauling dirt or loose materials off site; ▪ Storage of hazardous materials within an established containment area; ▪ Inspection of construction equipment daily for leaks of oil, lubricants, or other potential stormwater pollutants, placement of plastic over any ground surface where fueling or equipment maintenance is to occur, and placement of drip pans under equipment parked on site; and ▪ Keeping emergency spill kits and an adequate supply of erosion control materials (gravel, straw bales, shovels, etc.) on site at all times. 	<p>SVWD responsible for including measure in construction specifications.</p> <p>Contractor responsible for implementation during construction.</p>	<p>Include measure in construction specifications and contracts: Prior to construction.</p> <p>Implementation of BMPs: During construction.</p>
<i>Noise</i>		
<p>MM NOI-1: Construction Noise. The Scotts Valley Water District and its contractor shall implement appropriate best management practices (BMPs) to reduce construction noise levels emanating from construction activities with a primary goal to minimize disruption and annoyance at existing noise-sensitive receptors in the Project vicinity. A detailed construction noise reduction plan shall be developed identifying the schedule for major noise-generating construction activities and procedures for coordination with the owner/occupants of nearby noise-sensitive land uses, so that construction activities can be scheduled to minimize noise disturbances. The Project's contractor shall implement, but would not be limited to, the following measures related to construction noise:</p> <ul style="list-style-type: none"> ▪ Restrict construction activities and use of equipment that have the potential to generate significant noise levels (e.g., use of concrete saw, mounted impact hammer, jackhammer, rock drill, etc.) to between the hours of 7:00 a.m. and 7:00 p.m., Monday through Friday, and between 8:00 a.m. and 6:00 p.m. on Saturdays and Sundays. 	<p>SVWD responsible for including measure in construction specifications.</p> <p>Contractor responsible for implementation during construction.</p>	<p>Development of noise reduction plan: Prior to the initiation of construction activities.</p> <p>Implementation of measure: During construction.</p>

Table F-1. Grace Way Well Project Mitigation Monitoring and Reporting Program

Mitigation Measures and Standard Practices	Party Responsible for Implementation	Implementation Timing
<ul style="list-style-type: none"> ▪ Construction activities requiring operations continuing outside of daytime hours (e.g., borehole drilling) shall locate noise-generating equipment as far as feasibly possible from noise-sensitive receptors. ▪ Construction equipment and selection thereof shall make use of quiet technologies where such technologies or models exist. ▪ Maximum physical separation, as far as practicable, shall be maintained between construction equipment and adjacent noise-sensitive land uses/receptors. ▪ Construction equipment and vehicles shall be fitted with efficient, well-maintained mufflers that reduce equipment noise emission levels at the Project site. Internal-combustion-powered equipment shall be equipped with properly operating noise-suppression devices (e.g., mufflers, silencers, wraps) that meet or exceed the manufacturer's specifications. Mufflers and noise suppressors shall be properly maintained, tuned, and inspected on a routine basis to ensure proper fit, function, and minimization of noise. ▪ Impact tools shall have the working area/impact area shrouded or shielded whenever possible, with intake and exhaust ports on power equipment muffled or suppressed and directed away from nearby noise-sensitive receptors. This may necessitate the use of temporary or portable, application-specific noise shields, enclosures, or barriers. ▪ Site support equipment such as pumps, generators, air compressors and other stationary noise-generating equipment shall be located within acoustically treated enclosures, shrouded, or shielded to prevent the propagation of sound in the direction of nearby noise-sensitive receptors in the surrounding areas, regardless of construction hours. Acoustical enclosures, shrouds, or temporary barriers shall meet or exceed a sound transmission class (STC) rating of 27 or greater. ▪ Construction equipment shall not be idled for extended periods of time (i.e., 5 minutes or longer) in the immediate vicinity of noise-sensitive receptors or when not foreseeably in use. ▪ The contractor shall designate and identify a "disturbance coordinator" who will be the responsible point of contact for construction noise concerns or complaints. The disturbance coordinator's contact phone number along with the appropriate Scotts Valley Water District contact information shall located on a sign, conspicuously placed and clearly visible to the public. The disturbance coordinator will determine the cause of the noise complaint and respond to or implement corrective action within 48-hours, to resolve the issue(s) which the complaint is regarding. All complaints shall be logged, noting the date, time, issuing party's name and contact information, the nature of the complaint, and any corrective action taken to resolve the issue. 		

Table F-1. Grace Way Well Project Mitigation Monitoring and Reporting Program

Mitigation Measures and Standard Practices	Party Responsible for Implementation	Implementation Timing
STANDARD OPERATIONAL PRACTICE		
<p>Operation of the extractions anticipated by the Project will be consistent with sustainable management criteria developed by the SMGWA, including ensuring undesirable results identified in the DWR-approved Santa Margarita Groundwater Basin GSP and in any future revisions to the GSP do not occur. To avoid any undesirable results in the Santa Margarita Groundwater Basin and to maintain groundwater basin sustainability, minimum threshold groundwater elevations identified in the GSP at representative monitoring points close to the Project cannot be exceeded during operation of the Project. If groundwater elevations approach minimum thresholds in representative monitoring points close to the Project, the SVWD would need to redistribute pumping amongst its other wells or implement conjunctive use or managed recharge projects.</p>	<p>SVWD responsible for monitoring groundwater levels, redistribution of pumping, or implementation of projects.</p>	<p>Implement measure during operation.</p>

STATE WATER RESOURCES CONTROL BOARD

1001 I Street, Sacramento, California 95814
http://www.waterboards.ca.gov/water_issues/programs/npdes

ORDER WQ 2014-0194-DWQ GENERAL ORDER NO. CAG140001

STATEWIDE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR DRINKING WATER SYSTEM DISCHARGES TO WATERS OF THE UNITED STATES

Discharges from drinking water systems to surface waters in California are subject to waste discharge requirements as set forth in this Order, and as authorized by a Notice of Applicability issued by the Deputy Director of Water Quality (Deputy Director). Definitions for the purpose of this Order are included in Attachment A. Key definitions are as follows:

Table 1. Key Definitions for the Purpose of this Order

Drinking Water System ¹	<p>A system with 1000² connections or greater that are regulated by the State Water Board Division of Drinking Water or a local county department of health, with the primary purpose of transmitting, treating and distributing safe drinking water. Drinking water systems include state owned/operated facilities such as parks, campgrounds, and rest areas</p> <p>¹ This Order applies to community water systems as defined in Attachment A of this Order. This Order does not apply to non-community water systems or non-transient water systems as defined in Attachment A of this Order.</p> <p>² Systems with fewer than 1000 connections that discharge to waters of the United States have the option to enroll in this Order. Non-enrollment does not exempt dischargers from Clean Water Act requirements.</p>
Drinking Water System Discharge	Short-term or seasonal discharges from a drinking water system of water that has been dedicated for drinking water purposes
Water Purveyor	Any entity that discharges from a drinking water system, including water purveyors, wholesalers, distributors, districts, municipalities, private companies, and other entities that own or operate a community drinking water system
Discharger	A water purveyor that is authorized to discharge under this Order through an approved Notice of Applicability issued by the Deputy Director of Water Quality
Waters of the United States	Generally refers to surface waters, as defined for the purposes of the federal Clean Water Act. For the purpose of this Order, the terms “surface water,” and “receiving water” are interchangeably used to mean “waters of the United States,” unless noted otherwise

Table 2. Administrative Information

This Order was adopted by the State Water Board on November 18, 2014:
This Order shall become effective on February 26, 2015 (100 days after the adoption date of this Order)
This Order shall expire on February 25, 2020

CERTIFICATION


I, Jeanine Townsend, Clerk to the Board, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the State Water Board on November 18, 2014.

AYE: Chair Felicia Marcus
Vice Chair Frances Spivy-Weber
Board Member Tam M. Doduc
Board Member Steven Moore
Board Member Dorene D'Adamo

NAY: None

ABSENT: None

ABSTAIN: None



Jeanine Townsend
Clerk to the Board

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I. SCOPE OF STATEWIDE GENERAL ORDER AND REQUIRED REGULATORY COVERAGE

This Order is a National Pollutant Discharge Elimination System (NPDES) general permit that authorizes discharges from drinking water systems, as defined on Page 1 of this Order. This Order provides regulatory coverage for short-term or seasonal planned and emergency (unplanned) discharges resulting from a water purveyor's essential operations and maintenance activities undertaken to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water permitting requirements for providing reliable delivery of safe drinking water.

Planned discharges include regularly scheduled, automated, or non-regularly scheduled activities that must take place to comply with mandated regulations and that the water purveyor knows in advance will result in a discharge to surface water. Emergency discharges include unplanned discharges that occur due to facility leaks, system failures, operational errors, or catastrophic events for which the water purveyor is not aware of the discharge until after the discharge has commenced. Planned and emergency discharges may occur directly, through a constructed storm drain or through another conveyance system, to waters of the United States (U.S.).

The Federal Water Pollution Control Act (also referred to as the Clean Water Act) section 402 requires that a discharge of any pollutant or combination of pollutants to surface waters that are deemed waters of the U.S., with certain exceptions, be regulated by a NPDES permit. (For the purpose of this Order, the terms "waters of the United States [or U.S.]", "surface waters" and "receiving waters" are used interchangeably unless noted otherwise.) On September 22, 1989, the U.S. Environmental Protection Agency (U.S. EPA) granted the State of California, through the State Water Resources Control Board (State Water Board) and the Regional Water Quality Control Boards (Regional Water Boards), the authority to issue NPDES permits pursuant to title 40 Code of Federal Regulations parts 122 and 123.

Discharges of a pollutant from a drinking water system, regardless of the size of the system, are required to be regulated by an NPDES permit if the discharges flow into a water of the U.S. Title 40 Code of Federal Regulations part 122.28 provides for issuance of general permits to regulate a category of dischargers if they involve the same or substantially similar types of operations; discharge the same type of waste; require the same type of effluent limitations or operating conditions; require similar monitoring; and are more appropriately regulated under a general order rather than individual orders. Discharges from drinking water systems that result from mandated activities to protect public health are of substantially similar types of operations, discharging the same type of waste.

This Order requires all water purveyors in California with drinking water system discharges to waters of the U.S. as described in Section I.B of this Order, except those water purveyors that meet the exception criteria identified in section I.A of this Order, to obtain NPDES regulatory coverage through enrollment in this statewide NPDES General Order. The water purveyor shall submit an application package to the State Water Board in accordance with section II.C.1 *Application Package Requirements* any time after the effective date of the permit but no later than **September 1, 2015**.

A. Water Purveyors NOT Required to Enroll in This Order

Water purveyors that meet any of the following criteria, items 1 through 6, are NOT required to submit an application package to obtain coverage through enrollment in this particular statewide NPDES General Order; this Order is, however, available for water purveyors that meet the criteria of items 1 through 3 below and choose to enroll. (This Order does not exempt any water purveyor from federal Clean Water Act requirements to obtain NPDES regulatory coverage for its discharges to waters of the U.S.) By **September 1, 2015**, water purveyors that meet any one of the items 2 through 5 below shall submit to the State Water Board a Notice of Non-Applicability form (see Attachment B-2) that certifies NPDES regulatory coverage from this Order is not required. A water purveyor with multiple community water systems in California need only submit one Notice of Non-Applicability for its systems that meet the same criterion.

1. The drinking water system has fewer than 1000 connections that deliver drinking water to end users. (This does not include water wholesalers as defined in Attachment A that deliver water to other drinking water systems); or
2. The water purveyor discharges solely to a municipal separate storm sewer system(s) (MS4) and has an established local agreement with the MS4 permittee to discharge into its system(s),

AND

The corresponding Regional Water Board Executive Officer provides written confirmation to the State Water Board Deputy Director that the local agreement provides sufficient regulation of the subject drinking water system discharges through an existing MS4 NPDES permit; or

3. The water purveyor is an MS4 permittee, or co-permittee, named on a State Water Board or a Regional Water Board issued MS4 permit that also authorizes discharges from drinking water systems, and all drinking water system discharges solely discharge into its own MS4 system; or
4. The water purveyor's discharge is regulated under an existing individual site-specific NPDES permit issued by the Regional Water Board because: (1) the discharge from the system is outside of the scope of this low threat Order, and/or (2) a Total Maximum Daily Load (TMDL) was adopted and the Regional Water Board determined that TMDL-specific permit requirements for its drinking water system(s) discharges are appropriate because those discharges may contribute to the impairment of the water body; or
5. All discharges from the drinking water system do not discharge to a water of the U.S.; or
6. The discharge is exempt from the legal requirement to obtain an NPDES permit under federal law.

After review, a Notice of Non-Applicability Approval by the State Water Board's Deputy Director of Water Quality (Deputy Director) may be issued. If the Notice of Non-Applicability is not complete or the discharge is deemed ineligible, the Deputy Director will send a response letter to the applicant outlining: (1) the missing information that deems the Notice of Non-Applicability incomplete, or (2) why the described discharge is not eligible and thus the water purveyor must obtain coverage under this Order. The State Water Board will provide the water purveyor **60 days from the date of the response letter** to provide State Water Board staff the items necessary to complete the Notice of Non-Applicability or to submit a complete application package in accordance with section II.C of this Order.

B. Discharges Authorized Under This Order

This Order authorizes drinking water system discharges (as defined on Page 1) resulting from a water purveyor's essential operations and activities undertaken to comply with the federal Safe Drinking Water Act, the California Health and Safety Code, and the State Water Board's Division of Drinking Water permitting requirements. Discharges authorized by this Order are composed solely of water that is dedicated by drinking water facilities for the primary purpose of providing safe and reliable drinking water. Additionally, discharges authorized under this Order are determined to not adversely affect or impact beneficial uses of the receiving waters when properly managed through best management practices. Such discharges include, but are not limited to, discharges from supply wells, transmission systems, water treatment facilities, water distribution systems, and storage facilities. Any discharges that are likely to cause or contribute to an exceedance of a water quality objective other than those granted an exception under the State Water Board Resolution 2014-0067, will not be authorized under this Order.

This Order authorizes single discharges at one identified location and multiple simultaneous discharges at multiple locations. Authorized discharges to waters of the U.S. may include, but are not limited to, the following discharges:

1. Planned Discharges Due To:

- a. Groundwater supply well flushing or pump-to-waste.
- b. Groundwater well development, rehabilitation, and testing.
- c. Groundwater monitoring for purpose of supply well development, rehabilitation and testing.
- d. Trench dewatering of drinking water during planned repairs.
- e. Transmission system installation, cleaning, and testing.
- f. Water treatment plant operations (excluding filter backwash that is discharged to a water of the U.S).
- g. Distribution system storage tank or reservoir releases.
- h. Distribution system dewatering, flushing, and pressure testing.
- i. Fire flow / fire hydrant testing.
- j. Meter testing.

- k. Automated water quality analyzers operations.
- l. Pressure relief valves.
- m. Unscheduled activities that must be undertaken to comply with mandates of the Federal Drinking Water Act and California Health and Safety Code.

2. Emergency (Unplanned) Discharges Due To:

- a. Emergency drinking water system failures and repairs including transmission and distribution system failures and repairs.
- b. Trench dewatering due to an emergency failure.
- c. Operation errors.
- d. Catastrophic events.

C. Discharges Not Authorized Under This Order

The State Water Board does not authorize any of the following discharges to waters of the U.S. under this Order:

- 1. Discharges that are not within the scope of this Order as described in section I and/or are not authorized by a Notice of Applicability issued by the Deputy Director of Water Quality (Deputy Director); or
- 2. Discharges to a water of the U.S. with a total maximum daily load (TMDL) that prescribes a waste load allocation to a water purveyor, where the Deputy Director determines that the requirements of this Order are not consistent with the assumptions and requirements of the TMDL and thus compliance with this Order is not sufficient for the water purveyor to comply with the imposed TMDL requirements; or
- 3. Discharges from new drinking water systems (not an expansion of an existing system) into a Clean Water Act section 303(d)-listed impaired water body that is impaired for a constituent that exists in the new discharge at a concentration greater than the criteria used to establish the impairment of the water body, and for which a regional water board has issued an individual permit that addresses the TMDL requirements; or
- 4. Direct discharges into areas designated by the State Water Board as Areas of Special Biological Significance (ASBS).

II. PERMIT COVERAGE AND APPLICATION REQUIREMENTS

A. Permit Coverage

This Order provides regulatory coverage to water purveyors with existing and potential authorized discharges as set forth in section I.B to waters of the U.S. from a community drinking water system that does not adversely affect or impact beneficial uses of the

receiving water. Permit coverage may include discharges from work conducted by contractors on behalf of the water purveyor.

B. Permit Effective Date

This Order becomes effective **February 26, 2015**, 100 days after the adoption date of this Order. Any time after the effective date but no later than **September 1, 2015**, all water purveyors that do not meet the criteria of section I.A. of this Order shall submit a complete application package in accordance with the following section II.C.

C. Application Package Requirements

To obtain regulatory coverage under this Order, a water purveyor must submit to the State Water Board a complete application package that includes all the following items. A water purveyor with multiple drinking water systems in California need only submit one complete application package (with individual Notice of Intent forms for each of its drinking water systems) and obtain one Notice of Applicability for regulatory coverage of all its systems that discharge to waters of the U.S.

1. **Notice of Intent.** A completed Notice of Intent form for each of its drinking water systems (shown as Attachment B1 of this Order), signed and certified in accordance with section V.B., *Signatory and Certification Requirements*, of Attachment D – Standard Provisions.
2. **Application Package Fee.** A fee payable to the State Water Board in accordance with California Code of Regulations, title 23, or subsequent fee regulations updates. The current fee schedule is available at the following website:
<http://www.waterboards.ca.gov/resources/fees>
Only one fee is required for an application package requesting coverage for multiple drinking water systems.
3. **Site Information.**
 - a. A site schematic showing the following items:
 - i. The general location of the community drinking water facilities and/or the boundaries of the water purveyor's service area(s); and
 - ii. The general location of groundwater supply wells and/or any discharge locations to surface waters; and
 - iii. General identification of the portion of the community water system that discharges within a 300-foot conveyance distance from the receiving water(s) and/or within a 300-foot radius of the receiving water(s).
 - b. Names of all named receiving water bodies and/or major downstream water bodies.

- c. A description of the multiple uses of the water prior to surface water discharge or beneficial reuse that the discharges will serve (i.e. ground water recharge, irrigation).
 - d. Reason(s) that the discharge water cannot be utilized for multiple uses or beneficial reuse. (Refer to section VI. MULTIPLE USES OR BENEFICIAL REUSE, below)
4. **Total Maximum Daily Loads (TMDL) Constituent-specific Application Package Supplement** (applicable for discharges into waters of the U.S. identified in section III. K of the Fact Sheet). A supplement to the application requirements listed above shall include the following items:
- i. **Laboratory Analysis of TMDL-specific constituent(s).** (The laboratory analysis shall be conducted by a laboratory certified by the Environmental Laboratory Accreditation Program (ELAP).) The application package supplement shall include a laboratory analysis sheet(s) indicating the concentration of the applicable TMDL specific constituent(s) in the drinking water system discharge at the point of discharge. The monitoring and analysis shall be conducted in accordance with title 40 Code of Federal Regulations part 136. The water purveyor shall submit the following items for the application supplement to be deemed complete:
 - a) A minimum of two samples representative of the drinking water system discharge that contains or has the potential to contain the greatest concentration or level of constituent/parameter associated with the TMDL constituent/parameter. The samples shall be taken at a location after the appropriate treatment or controls are implemented for the constituent associated with the TMDL; and
 - b) The estimated minimum and maximum discharge volume per discharge event; and
 - c) The estimated average discharge volume from the system per year. The estimated volumes may be based on historical data.
 - ii. **TMDL-specific Best Management Practices.** Description of site-specific best management practices that properly treat and/or control corresponding TMDL constituents in the discharge to a concentration or level less than the water purveyor's applicable TMDL-specific permit requirement (s) as set forth in Attachment G, if any.

The supplemental analytical information will be used to confirm that the discharge does not contribute to the specific impairment of the TMDL-related waterbody(ies) and that the requirements in this Order are sufficient to ensure compliance with the specific TMDLs.

D. State Water Board Notice of Applicability

After the water purveyor's application package is deemed complete, the Deputy Director will issue a Notice of Applicability. Regulatory coverage for the planned and emergency

discharges that occur within the areas identified in the application package commences with the date of issuance of a Notice of Applicability to the water purveyor. If the submitted application package is not complete in accordance with previous section II.C., or the discharge is deemed ineligible for coverage under this Order, the Deputy Director will send a response letter to the applicant outlining: (1) the missing information that renders the application package incomplete, or (2) why the described discharge is not eligible for coverage under this Order. The water purveyor will have **60 days from the date of the response letter** to provide State Water Board staff the items necessary to complete the application package.

E. Permit Coverage Termination

1. **Termination of Existing Regional Water Board Permit Coverage.** Upon the issuance of the NOA in accordance with this Order, the State Water Board expects the applicable Regional Water Board to terminate regulatory coverage under an existing non-MS4 Regional Water Board NPDES permit for discharges within the scope of this Order.
2. **Termination of Statewide Permit Coverage or Revocation of Notice of Non-Applicability.** The Deputy Director may terminate coverage or revoke a Notice of Non-Applicability Approval (NONAA) under this Order for any of the specified causes, and require application for coverage under an individual or other NPDES permit as set forth in title 40 Code of Federal Regulations part 122.28(b)(3). Causes for permit coverage termination or NONAA revocation include, but are not limited to, the following:
 - a. Violation of any term or condition of this Order; or
 - b. Misrepresentation or failure to disclose all relevant facts in obtaining permit coverage or non-applicability status under this Order, or
 - c. Written request from a Discharger to terminate enrollment because discharge has ceased or that the permit is no longer needed.

Annual permit fees will be assessed by the State Water Board up to the date of written termination notification from the State Water Board to the Discharger, or the date of a termination request letter from the Discharger to the State Water Board, whichever is applicable.

3. **Qualified Biologist Certification Following Project Completion.** Upon completion of the project, the Discharger shall provide certification by a qualified biologist that beneficial uses of the receiving waters have been restored. For drinking water system discharges, completion of the project is when the water purveyor ceases discharges from its drinking water system under this Order, or when the State terminates NPDES permit coverage for the discharge(s).

F. Permit Transfer

A change in ownership of the facilities authorized to discharge through coverage under this Order requires the current owner to provide written notice to the State Water Board

at least 30 days in advance of transfer of ownership. The Deputy Director may determine that the new owner must submit an application package to seek coverage under this Order if the nature or location(s) of the discharge(s) have changed from the application package on file.

III. FINDINGS

The State Water Board finds the following:

- A. Legal Authorities.** This Order serves as statewide Waste Discharge Requirements (WDRs) pursuant to California Water Code article 4, chapter 4, division 7 (commencing with § 13260). This Order is also issued pursuant to federal Clean Water Act (CWA) section 402 and implementing regulations adopted by the U.S. EPA, and the California Water Code, chapter 5.5, division 7 (commencing with § 13370). This Order shall serve as a statewide general NPDES permit for point source discharges from single or multiple discharge points to surface waters, storm drains, and other storm water conveyances leading to waters of the U.S.
- B. Background and Rationale for Requirements.** The Fact Sheet (Attachment F) contains background information and rationale for the requirements in this Order, and is hereby incorporated into and constitutes findings for this Order. Attachments A through E, G, and H are also incorporated into this Order.
- C. Termination of Existing Coverage Under Similar Regional Water Board Orders.** The State Water Board's intention in the issuance of this statewide NPDES Permit is to provide consistent and efficient regulation of discharges from drinking water systems statewide. To provide such consistency, the State Water Board intends that existing regulatory coverage under an existing non-MS4 Regional Water Board NPDES permit for discharges regulated under this Order will be terminated by the applicable regional water board upon issuance of the Notice of Applicability to a water purveyor per the terms of this Order.
- D. Threat and Complexity of Discharge.**
When mitigated through implementation of appropriate management practices, treatment and/or controls, discharges from community water systems, as defined under this Order, pose no adverse effects or impacts to beneficial uses of the receiving waters. In accordance with the State Water Board fee regulations, the discharges that are regulated under this general NPDES Permit require minimal or no additional treatment systems to meet limits and pose no significant threat to water quality and therefore are of low threat and low complexity.
- E. State Implementation Policy.** As adopted in March 2000, and amended in February 2005, the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP) establishes implementation provisions for priority pollutant criteria, and objectives and provisions for chronic toxicity control. Section 5.3 of the SIP allows for the granting of a categorical exception for drinking water system activities conducted to fulfill statutory requirements mandated by federal and state regulations.

- F. California Ocean Plan.** In 1972, the State Water Board adopted the Water Quality Control Plan for Ocean Waters of California (hereinafter Ocean Plan), as amended. The latest Ocean Plan amendment became effective on August 19, 2013. The Ocean Plan is applicable, in its entirety, to point source discharges to the ocean waters of the State. To protect the beneficial uses of ocean water, the Ocean Plan establishes water quality objectives and a program of implementation. Requirements of this Order implement the Ocean Plan and are applicable to those discharges directly into the Ocean or indirectly via a storm water system that drains into the Ocean near the location of discharge. This Order does not authorize direct discharges into Areas of Special Biological Significance (ASBS).

Section III.J of the Ocean Plan allows the State Water Board to grant an exception where the State Water Board determines that the exception will not compromise protection of the ocean waters or beneficial uses and the public interest will be served.

- G. Exception Resolution.** On November 18, 2014, the State Water Board adopted a Resolution approving an exception to the State Implementation Policy and the Ocean Plan to water purveyors statewide for discharges from drinking water systems from complying with specified priority pollutant criteria and ocean plan objectives. As provided in Resolution 2014-0067, the State Water Board granted an exception per section 5.3 of the State Implementation Policy to water purveyors statewide, for planned and emergency discharges to inland surface waters, enclosed bays and estuaries. Similarly, as provided in Resolution 2014-0067, the State Water Board granted water purveyors with drinking water system discharges to the ocean, other than direct discharges into ASBS, an Ocean Plan exception for compliance with specified Ocean Plan objectives. As further discussed in the Fact Sheet (Attachment F), the State Water Board finds that in accordance with the requirements of the SIP and Ocean Plan, discharges from drinking water systems qualify for an exception of the State Implementation Policy and Ocean Plan per Resolution 2014-0067.

- H. California Environmental Quality Act.** Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA), (commencing with section 21100) of Division 13 of the Public Resources Code.

Additionally, pursuant to CEQA, Public Resources Code section 21100 et seq., on November 18, 2014 the State Water Board adopted Resolution 2014-0067 approving a Mitigated Negative Declaration for excepting the type of discharges as covered under this Order from specified requirements of the State Implementation Policy and the California Ocean Plan.

- I. Total Maximum Daily Load (TMDL) Implementation.** A review of Regional Water Board TMDLs found that, as of the adoption date of this Order, only the Los Angeles Regional Water Board and the San Diego Regional Water Board have TMDLs that either directly apply waste load allocations to, or may indirectly imply that waste load allocations are applicable to, the discharges from drinking water systems regulated under this General Order. None of these TMDLs established waste load allocations that apply exclusively to discharges from drinking water systems. These TMDLs are

applicable to the discharges from drinking water systems authorized under this Order and are therefore implemented by this Order.

This Order requires TMDL-related sampling of discharges from drinking water systems identified in a TMDL. If a Regional Water Board determines that any of these TMDLs, or any newly approved TMDLs, establish requirements that should be implemented through TMDL-specific permit requirements for the discharges from drinking water systems that are authorized under this Order, the Regional Water Board may issue permit(s) for those discharges, with coverage under this Order subsequently terminated. Alternatively, if further TMDLs are adopted that address pollutants that are likely to be in discharges from drinking water systems, and allocate waste loads specifically to water purveyors regulated under this Order, the State Water Board may consider adding additional TMDL-specific permit requirements to Attachment G of this Order in a subsequent permit amendment or renewal.

J. Notification of Interested Parties. State and Regional Water Board staffs have conducted eight stakeholder meetings statewide, and numerous other informal communications, and have notified prospective water purveyors and interested agencies and persons of the intent to issue this statewide NPDES permit and prescribe these statewide waste discharge requirements. The State Water Board provided an opportunity for all interested parties to submit written comments and testimony.

K. Consideration of Public Comment. The State Water Board, in an August 5, 2014 public hearing, heard and considered public comments pertaining to the draft Order. The State Water Board also considered all written public comments submitted by the public comment due date of August 19, 2014, prior to adopting this Order. The Fact Sheet (Attachment F) provides details regarding the public notice and public hearing.

THEREFORE, IT IS HEREBY ORDERED that, in order to meet the provisions contained in California Water Code, Division 7 (commencing with section 13000) and regulations adopted thereunder, and the provisions contained in the Clean Water Act and regulations and guidelines adopted thereunder, a water purveyor shall comply with the requirements of this Order. Water purveyors that have obtained coverage under this Order shall comply with the requirements in sections IV. through VII. (Discharge Specifications and Effluent Limitations, Receiving Water Limitations, Multiple Uses or Beneficial Uses Provisions, and Compliance Determination), Attachments D and E (Standard Provisions and Monitoring and Reporting Program) of this Order, and Attachment G (TMDL-related requirements) as applicable.

IV. DISCHARGE SPECIFICATIONS AND EFFLUENT LIMITATIONS (ONLY APPLICABLE TO DISCHARGES THAT ENTER A WATER OF THE U.S.)

For purposes of this Order, references to “discharge(s)” mean discharge(s) that may occur directly, through a constructed storm drain, or through other conveyance system, to waters of U.S. The Discharger shall comply with the following discharge specifications and effluent limitations.

A. Specification for Implementation of Best Management Practices

1. The Discharger shall implement best management practices (BMPs) that treat or control pollutants from its discharges to maintain compliance with this Order. Implementation of BMPs includes proper management, and routing of discharges to control the pollutants of concern. The Discharger shall properly manage planned discharges and implement proven BMPs provided by professional associations or institutes such as the American Water Works Association, to protect beneficial uses of the receiving water body(ies). For emergency discharges, the Discharger shall implement BMP procedures as soon as feasible while concurrently protecting public health and safety. Attachment C of this Order provides example BMPs.

At minimum, the Discharger shall implement BMPs for planned discharges to achieve the following performance measures:

- i. Prevent aquatic toxicity by using dechlorination chemical additions, implementing equivalent proven dechlorination methods, and/or assuring that the chlorine in the discharge dissipates naturally; such that the level of chlorine in the discharge is less than 0.019 mg/L prior to entering a receiving water.
 - ii. Prevent riparian erosion and hydromodification by implementing flow dissipation, erosion control, and hydromodification-prevention measures; and
 - iii. Minimize sediment discharge, turbidity and color impacts by implementing sediment, turbidity, erosion and color control measures.
2. For Groundwater Supply Well Operations, the Discharger shall implement treatment systems or BMPs for all groundwater well development, rehabilitation, or operation discharges to waters of the U.S. to ensure these discharges:
 - (1) Do not cause or contribute to an exceedance of the receiving water limitation for turbidity in Section V.G. of this Order, and
 - (2) Comply with a turbidity action level of 100 Nephelometric Turbidity Units (NTUs) or less in the discharge. An exceedance of the turbidity numeric action level of 100 NTU is not a violation of this Order, but any exceedance does require that the Discharger take action to modify, change or enhance BMPs when the turbidity level is greater than 100 NTU, until the turbidity level is 100 NTU or less.
3. The Discharger shall implement quality assurance and quality control protocol to assure best management practices, monitoring, and reporting are effective, valid, and in compliance with this Order. The Discharger shall train all personnel operating the drinking water system and responding to emergency discharges to assure the quality assurance and quality control protocol is properly implemented.
4. For planned discharges, BMPs shall be implemented prior to and during discharges that enter a water of the U.S. For planned discharges from pressure relief valves (*i.e.*, due to testing or maintenance) and unchlorinated pump-to waste wells, BMPs

shall be implemented unless infeasible (e.g., inaccessible, inadequate space). For emergency discharges, BMPs shall be implemented as soon as feasible following assurance that public safety, property, and infrastructure are protected.

5. In fulfilling the requirements of this section, the Discharger may implement the example BMPs contained in Attachment C, or proven BMPs per updated approved guidance established by industry experts, professional associations, or entities (e.g. *2014 Edition of the BMP Manual for Drinking Water System Releases* published by the California-Nevada Section of the American Water Works Association).
6. The Discharger shall maintain a documented log of all BMPs implemented for its different types of discharges that enter a water of the U.S., and make it available to State and Regional Water Board staff upon request.
7. The Discharger shall modify BMPs as necessary to maintain compliance with the requirements of this Order. If monitoring results or other available information demonstrate that the discharge is not in compliance, the Discharger shall determine the source of non-compliance, and develop and implement new or revised BMPs as necessary. As part of this process, the Discharger shall validate the effectiveness of any new or revised BMPs to achieve the requirements of this Order. All non-compliance and corresponding corrective actions to address non-compliance shall be reported to the State Water Board in the annual report, as required in the Monitoring and Reporting Program (Attachment E) of this Order. A log documenting the additional or revised BMPs shall be made available upon request by staff of the State and/or Regional Water Board.

B. Effluent Limitations

1. All Discharges of Superchlorinated Water:

- a. The total chlorine residual concentration in the discharge shall not exceed 0.019 mg/L.
- b. A field monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation.

2. All Planned Discharges directly into, or within 300 feet of, Inland Surface Waters, Enclosed Bays, and Estuaries

- a. The total chlorine residual concentration in the discharge shall not exceed 0.019 mg/L.
- b. A field monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation.

3. All Planned Discharges directly into, or within 300 feet of, Ocean Waters

- a. The total chlorine residual concentration in the discharge shall not exceed 0.008 mg/L.
- b. A field monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation.

- c. The turbidity concentration in the discharge shall not exceed 225 NTU at any time.

V. RECEIVING WATER LIMITATIONS

Receiving water limitations are based on water quality objectives contained in Regional Water Quality Control Board Basin Plans and State Water Board water quality control plans, including the Ocean Plan, and policies, and are a required part of this Order. Drinking water system discharges to the receiving water that are authorized to discharge under this Order shall not cause or contribute to the exceedance of a water quality objective or standard in the receiving water, other than water quality objectives or standards for parameters that have been granted an exception under the State Water Board Resolution 2014-0067 and are not part of a TMDL, and at minimum shall not cause or contribute to an occurrence of the following in the receiving water:

- A. **pH.** The pH level to be outside the range of the pH receiving water objective in a corresponding Regional Water Board basin plan.
- B. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.
- C. **Floating Material and Trash.** Floating material, debris or trash to be present that cause nuisance or adversely affect beneficial uses.
- D. **Sediment and Total Suspended Solids.** The sediment load and total suspended solids discharge rate of surface waters to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
- E. **Toxicity.** Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.
- F. **Hydromodification.** Velocity and/or volume of discharge to modify the existing physical characteristics of a water body.
- G. **Turbidity.** Turbidity concentrations to exceed corresponding Regional Water Board basin plan water quality objectives for turbidity.

VI. MULTIPLE USES OR BENEFICIAL REUSE

The discharge to surface waters may be considered wasteful when it is feasible for the water to be used prior to discharge. The State Water Board strongly encourages all water purveyors to put all or part of the discharge water to multiple uses or a beneficial reuse prior to discharge into surface water. Because of the high quality of the discharge water addressed in this Order, discharges authorized under this Order that are put to multiple use or beneficial reuse are not required to be monitored and generally not required to obtain any other waste discharge requirements if the water that would otherwise be discharged is instead collected and reused for landscape irrigation, agricultural irrigation or other uses in

a manner that augments the existing water supply, or if the discharge is directly or indirectly discharged to: (1) storm water capture basin(s), (2) low impact development features, or (3) other groundwater-recharge system(s).

VII. PROVISIONS

A. Standard Provisions

The Discharger shall comply with all Standard Provisions in Attachment D.

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program requirements in Attachment E.

C. Special Provisions

1. Reopener Provisions

The State Water Board may modify or reopen this Order prior to its expiration date in any of the following circumstances:

- a. If present or future investigations demonstrate that the discharges governed by, and in compliance with, this Order cause adverse impacts on water quality or beneficial uses of the receiving waters;
- b. If State Water Board precedential decisions, new policies, new laws, or new regulations are adopted;
- c. To include specific implementation provisions in Attachment G for any existing or newly adopted TMDLs;
- d. If an administrative or judicial decision on a separate NPDES permit or Waste Discharge Requirements addresses requirements applicable to discharges authorized in this Order; and/or
- e. As otherwise authorized by law.

D. Noncompliance

Noncompliance with any requirement of this Order may be subject to enforcement action by the State Water Board and/or Regional Water Board as authorized under the Porter Cologne Water Quality Control Act (Water Code Section 13000), consistent with the State Water Board's enforcement policy.

VIII. COMPLIANCE DETERMINATION FOR PLANNED DISCHARGES

Compliance with the final effluent limitations contained in Section IV.B of this Order will be determined as specified below:

A. Permit Compliance for Planned Discharges only

Compliance with applicable effluent limitations, BMP implementation requirements, receiving water limitations, monitoring, notification, and reporting requirements of the permit constitutes compliance with this Order. Due to the infeasibility of a Discharger to self-monitor compliance with receiving water limits in distant receiving water bodies (for discharges into drainage conveyance systems), non-compliance with receiving water limitations for indirect discharges will be determined based on additional site-specific information made available to the Water Boards indicating that drinking water system discharges caused or contributed to the exceedance of the receiving water limitations and adversely impacted beneficial uses.

B. General

Compliance with effluent limitations shall be determined using monitoring and reporting protocols defined in the Monitoring and Reporting Program of this Order. For purposes of reporting and administrative enforcement by the State and/or Regional Water Boards, the Discharger shall be deemed out of compliance with the effluent limitations if the constituent concentration or level is greater than the effluent limitation and greater than or equal to the minimum level (ML, also known as the Reporting Level (RL)) of properly calibrated in-field monitoring equipment.

C. Total Residual Chlorine

Handheld chlorine measuring devices that are U.S. EPA-approved are appropriate to measure residual chlorine in the field for compliance determination. The minimum level of a hand-held chlorine meter used to determine compliance with the total chlorine residual effluent limitations is 0.1 mg/L or lower. A discharge monitoring result with a total residual chlorine concentration greater than or equal to 0.1 mg/L shall be deemed out of compliance with a chlorine effluent limitation. Due to other possible interferences of these handheld devices, if readings are false positives, these will not be evaluated for compliance if explanation of cause of false positive is provided.

2-D DWR GRANT COMPLIANCE REQUIREMENTS

1. California Department of Water Resources – Grant Terms and Conditions for Contractors and Subs
2. California Department of Water Resources – Grant Agreement Exhibit D - Standard Conditions
3. California Executive Order N-6-22 (EO) – Russian – Ukraine Execute Order

END OF DOCUMENT

**Urban And Multibenefit Drought Relief Grant
Grant Agreement Number 4600014630
Summary of Grant Terms and Conditions Applicable to
Consultants, Subconsultants, Contractors & Subcontractors**

Funding for this project is supported in part by a grant award from the California Department of Water Resources (DWR) to the Scotts Valley Water District (SVWD). The SVWD (Grantee) received and entered into an agreement with the State of California (Agreement #4600014630) funded by the Budget Act of 2021, (Stats. 2021, ch. 240, § 80). The Grantee will receive grant funding for services to be performed by the Consultant and its consultants, contractors or subcontractors (collectively, "Consultant"). The Grant Agreement identifies all terms and conditions applicable to the Consultant. For ease of reference, a summary of terms and conditions applicable to the consultant are provided below. To comply with the conditions of the Agreement, the Consultant agrees to the following:

INELIGIBLE PROJECT COST. Costs that are not eligible for reimbursement by grant funds include, but are not limited to the following items:

- A. Purchase of equipment not an integral part of a project.
- B. Travel and per diem costs, except for mileage. Mileage reimbursement will be at the State travel amounts that are current as of the date costs are incurred.
- C. Meals, food items, or refreshments.
- D. Generic overhead, markup (e.g., 10% mark-up on sub-contractor labor, materials, supplies). and Indirect Costs. "Indirect Costs" means those costs that are incurred for a common or joint purpose benefiting more than one cost objective and are not readily assignable to the funded project (i.e., costs that are not directly related to the funded project).

This prohibition applies to the Consultant and any subcontract or sub-agreement for work on the Project that will be reimbursed pursuant to this Agreement. This is consistent with Grant Agreement Item 7.

ACCOUNTING: The Consultant shall maintain books, records, and other documents pertinent to their work in accordance with generally accepted accounting principles and practices. Records are subject to inspection by the State at any and all reasonable times. This is consistent with Grant Agreement Standard Condition D1.

AUDITS: Pursuant to Government Code §8546.7, the Consultant shall be subject to the examination and audit by the State for a period of three (3) years after final payment under this Funding Agreement with respect to all matters connected with this Funding Agreement, including but not limited to, the cost of administering this Funding Agreement. All records of the Consultant and its contractor or subcontractors shall be preserved for this purpose for at least three (3) years after receipt of the final disbursement under this Agreement. This is consistent with Grant Agreement Standard Condition D.5.

CONFLICT OF INTEREST: The Consultant is subject to State and Federal conflict of interest laws. Failure to comply with these laws, including business and financial disclosure provisions, will result in the application being rejected and any subsequent contract being declared void. Other legal action may also be taken. Applicable statutes include, but are not limited to, Government Code section 1090 and Public Contract Code sections 10410 and 10411, for State conflict of interest requirements. This is consistent with Grant Agreement Standard Condition D.13.

DRUG-FREE WORKPLACE CERTIFICATION: The Consultant hereby certifies, under penalty of perjury under the laws of State of California, compliance with the requirements of the Drug-Free Workplace Act of 1990 (Gov. Code, § 8350 et seq.) and have or will provide a drug-free workplace. This is consistent with Grant Agreement Standard Condition D.16.

ADDITIONAL INSURED: The Consultant and its Contractors and subcontractors shall name the State, its officers, agents, and employees as additional insured on their liability insurance for activities undertaken pursuant to this Agreement. This is consistent with Grant Agreement Standard Condition D.22.

INSPECTION OF PROJECT BY STATE: State shall have the right to inspect the work being performed at any and all reasonable times during the term of the Funding Agreement. This right shall extend to any subcontracts, and Grantee shall include provisions ensuring such access in all its contracts or subcontracts entered into pursuant to its Funding Agreement with State. This is consistent with Grant Agreement Standard Condition D.25.

LABOR CODE COMPLIANCE: The Consultant and its contractors or subcontractors agree to be bound by all the provisions of the Labor Code regarding prevailing wages and shall monitor all contracts subject to reimbursement from this Agreement to assure that the prevailing wage provisions of the Labor Code are being met. Current Department of Industrial Relations (DIR) requirements may be found at: <http://www.dir.ca.gov/lcp.asp>. For more information, please refer to DIR's *Public Works Manual* at: <http://www.dir.ca.gov/dlse/PWManualCombined.pdf>. The Grantee affirms that it is aware of the provisions of section 3700 of the Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self insurance, and the Grantee affirms that it will comply with such provisions before commencing the performance of the work under this Agreement and will make its contractors and subcontractors aware of this provision. This is consistent with Grant Agreement Standard Condition D.26.

NONDISCRIMINATION: During the performance of this Funding Agreement, the Consultant and its contractors or subcontractors shall not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex (gender), sexual orientation, race, color, ancestry, religion, creed, national origin (including language use restriction), pregnancy, physical disability (including HIV and AIDS), mental disability, medical condition (cancer/genetic characteristics), age (over 40), marital/domestic partner status, gender identity, and denial of medial and family care leave or pregnancy disability leave. The Consultant and its contractors or subcontractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. The Consultant and its contractors or subcontractors shall comply with the provisions of the California Fair Employment and Housing Act (Gov. Code, § 12990.) and the applicable regulations promulgated there under (Cal. Code Regs., tit. 2, § 11000 et seq.). The applicable regulations of the Fair Employment and Housing Commission are incorporated into this Agreement by reference. The Consultant and its contractors or subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement. The Consultant shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Funding Agreement. This is consistent with Grant Agreement Standard Condition D.28.

PERFORMANCE BOND: Construction shall not be authorized to begin until each contractor has furnished a performance bond in favor of the Grantee in the following amounts: faithful performance (100%) of contract value, and labor and materials (100%) of contract value. This requirement shall not apply to any contract for less than \$25,000.00. Any bond issued pursuant to this paragraph must be issued by a California-admitted surety. (Civ. Code, § 9550, et seq.; Pub. Contract Code, § 7103; Code Civ. Proc., § 995.311.) This is consistent with Grant Agreement Standard Condition D.30.

SUSPENSION OF PAYMENTS: This Funding Agreement may be subject to suspension of payments or termination, or both if the State determines that:

- A. The Consultant, its contractors, or subcontractors have made a false certification, or
- B. The Consultant, its contractors, or subcontractors violates the certification by failing to carry out the requirements noted in this Funding Agreement.

This is consistent with Grant Agreement Standard Condition D.39.

EXHIBIT D**STANDARD CONDITIONS****D.1. ACCOUNTING AND DEPOSIT OF FUNDING DISBURSEMENT:**

- A. **Separate Accounting of Funding Disbursements:** Grantee shall account for the money disbursed pursuant to this Grant agreement separately from all other Grantee funds. Grantee shall maintain audit and accounting procedures that are in accordance with generally accepted accounting principles and practices, consistently applied. Grantee shall keep complete and accurate records of all receipts and disbursements on expenditures of such funds. Grantee shall require its contractors or subcontractors to maintain books, records, and other documents pertinent to their work in accordance with generally accepted accounting principles and practices. Records are subject to inspection by State at any and all reasonable times.
- B. **Disposition of Money Disbursed:** All money disbursed pursuant to this Grant agreement shall be deposited in a non-interest bearing account, administered, and accounted for pursuant to the provisions of applicable law.
- C. **Remittance of Unexpended Funds:** Grantee shall remit to State any unexpended funds that were disbursed to Grantee under this Grant agreement and were not used to pay Eligible Project Costs within a period of sixty (60) calendar days from the final disbursement from State to Grantee of funds or, within thirty (30) calendar days of the expiration of the Grant agreement, whichever comes first.

D.2. ACKNOWLEDGEMENT OF CREDIT AND SIGNAGE: Grantee shall include appropriate acknowledgement of credit to the State for its support when promoting the Project or using any data and/or information developed under this Grant agreement. Signage shall be posted in a prominent location at Project site(s) (if applicable) or at the Grantee's headquarters and shall include the Department of Water Resources color logo and the following disclosure statement: "Funding for this project has been provided in full or in part from the Budget Act of 2021 and through an agreement with the State Department of Water Resources." The Grantee shall also include in each of its contracts for work under this Agreement a provision that incorporates the requirements stated within this Paragraph.

D.3. AMENDMENT: This Grant agreement may be amended at any time by mutual agreement of the Parties, except insofar as any proposed amendments are in any way contrary to applicable law. Requests by the Grantee for amendments must be in writing stating the amendment request and the reason for the request. Requests solely for a time extension must be submitted at least 90 days prior to the work completion date set forth in Paragraph 2. Any other request for an amendment must be submitted at least 180 days prior to the work completion date set forth in Paragraph 2. State shall have no obligation to agree to an amendment.

D.4. AMERICANS WITH DISABILITIES ACT: By signing this Grant agreement, Grantee assures State that it complies with the Americans with Disabilities Act (ADA) of 1990, (42 U.S.C. § 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.

D.5. AUDITS: State reserves the right to conduct an audit at any time between the execution of this Grant agreement and the completion of the Project, with the costs of such audit borne by State. After completion of the Project, State may require Grantee to conduct a final audit to State's specifications, at Grantee's expense, such audit to be conducted by and a report prepared by an independent Certified Public Accountant. Failure or refusal by Grantee to comply with this provision shall be considered a breach of this Grant agreement, and State may elect to pursue any remedies provided in Paragraph 10 or take any other action it deems necessary to protect its interests. The Grantee agrees it shall return any audit disallowances to the State.

Pursuant to Government Code section 8546.7, the Grantee shall be subject to the examination and audit by the State for a period of three (3) years after final payment under this Grant agreement with respect of all matters connected with this Grant agreement, including but not limited to, the cost of administering this Grant agreement. All records of Grantee or its contractor or subcontractors shall be preserved for this purpose for at least three (3) years after receipt of the final disbursement under this Agreement.

- D.6. BUDGET CONTINGENCY: If the Budget Act of the current year covered under this Grant agreement does not appropriate sufficient funds for this program, this Grant agreement shall be of no force and effect. This provision shall be construed as a condition precedent to the obligation of State to make any payments under this Grant agreement. In this event, State shall have no liability to pay any funds whatsoever to Grantee or to furnish any other considerations under this Grant agreement and Grantee shall not be obligated to perform any provisions of this Grant agreement. Nothing in this Grant agreement shall be construed to provide Grantee with a right of priority for payment over any other Grantee. If funding for any fiscal year after the current year covered by this Grant agreement is reduced or deleted by the Budget Act, by Executive Order, or by order of the Department of Finance, the State shall have the option to either cancel this Grant agreement with no liability occurring to State, or offer a Grant agreement amendment to Grantee to reflect the reduced amount.
- D.7. CEQA: Activities funded under this Grant agreement, regardless of funding source, must be in compliance with the California Environmental Quality Act (CEQA). (Pub. Resources Code, § 21000 et seq.) Any work that is subject to CEQA and funded under this Agreement shall not proceed until documents that satisfy the CEQA process are received by the State's Project Manager and the State has completed its CEQA compliance. Work funded under this Agreement that is subject to a CEQA document shall not proceed until and unless approved by the Department of Water Resources. Such approval is fully discretionary and shall constitute a condition precedent to any work for which it is required. If CEQA compliance by the Grantee is not complete at the time the State signs this Agreement, once State has considered the environmental documents, it may decide to require changes, alterations, or other mitigation to the Project; or to not fund the Project. Should the State decide to not fund the Project, this Agreement shall be terminated in accordance with Paragraph 10, "Default Provisions."
- D.8. CHILD SUPPORT COMPLIANCE ACT: The Grantee acknowledges in accordance with Public Contract Code section 7110, that:
- A. The Grantee recognizes the importance of child and family support obligations and shall fully comply with all applicable state and federal laws relating to child and family support enforcement, including, but not limited to, disclosure of information and compliance with earnings assignment orders, as provided in Family Code section 5200 et seq.; and
 - B. The Grantee, to the best of its knowledge is fully complying with the earnings assignment orders of all employees and is providing the names of all new employees to the New Hire Registry maintained by the California Employment Development Department.
- D.9. CLAIMS DISPUTE: Any claim that the Grantee may have regarding performance of this Agreement including, but not limited to, claims for additional compensation or extension of time, shall be submitted to the DWR Project Representative, within thirty (30) days of the Grantee's knowledge of the claim. State and Grantee shall then attempt to negotiate a resolution of such claim and process an amendment to this Agreement to implement the terms of any such resolution.
- D.10. COMPETITIVE BIDDING AND PROCUREMENTS: Grantee's contracts with other entities for the acquisition of goods and services and construction of public works with funds provided by State under this Grant agreement must be in writing and shall comply with all applicable laws and regulations regarding the securing of competitive bids and undertaking competitive negotiations. If the Grantee does not have a written policy to award contracts through a competitive bidding or sole source process, the Department of General Services' *State Contracting Manual* rules must be followed and

are available at: <https://www.dgs.ca.gov/OLS/Resources/Page-Content/Office-of-Legal-Services-Resources-List-Folder/State-Contracting>.

- D.11. **COMPUTER SOFTWARE:** Grantee certifies that it has appropriate systems and controls in place to ensure that state funds will not be used in the performance of this Grant agreement for the acquisition, operation, or maintenance of computer software in violation of copyright laws.
- D.12. **CONFLICT OF INTEREST:** All participants are subject to State and Federal conflict of interest laws. Failure to comply with these laws, including business and financial disclosure provisions, will result in the application being rejected and any subsequent contract being declared void. Other legal action may also be taken. Applicable statutes include, but are not limited to, Government Code section 1090 and Public Contract Code sections 10410 and 10411, for State conflict of interest requirements.
- A. **Current State Employees:** No State officer or employee shall engage in any employment, activity, or enterprise from which the officer or employee receives compensation or has a financial interest and which is sponsored or funded by any State agency, unless the employment, activity, or enterprise is required as a condition of regular State employment. No State officer or employee shall contract on his or her own behalf as an independent contractor with any State agency to provide goods or services.
 - B. **Former State Employees:** For the two-year period from the date he or she left State employment, no former State officer or employee may enter into a contract in which he or she engaged in any of the negotiations, transactions, planning, arrangements, or any part of the decision-making process relevant to the contract while employed in any capacity by any State agency. For the twelve-month period from the date he or she left State employment, no former State officer or employee may enter into a contract with any State agency if he or she was employed by that State agency in a policy-making position in the same general subject area as the proposed contract within the twelve-month period prior to his or her leaving State service.
 - C. **Employees of the Grantee:** Employees of the Grantee shall comply with all applicable provisions of law pertaining to conflicts of interest, including but not limited to any applicable conflict of interest provisions of the California Political Reform Act. (Gov. Code, § 87100 et seq.)
 - D. **Employees and Consultants to the Grantee:** Individuals working on behalf of a Grantee may be required by the Department to file a Statement of Economic Interests (Fair Political Practices Commission Form 700) if it is determined that an individual is a consultant for Political Reform Act purposes.
- D.13. **DELIVERY OF INFORMATION, REPORTS, AND DATA:** Grantee agrees to expeditiously provide throughout the term of this Grant agreement, such reports, data, information, and certifications as may be reasonably required by State.
- D.14. **DISPOSITION OF EQUIPMENT:** Grantee shall provide to State, not less than thirty (30) calendar days prior to submission of the final invoice, an itemized inventory of equipment purchased with funds provided by State. The inventory shall include all items with a current estimated fair market value of more than \$5,000.00 per item. Within sixty (60) calendar days of receipt of such inventory State shall provide Grantee with a list of the items on the inventory that State will take title to. All other items shall become the property of Grantee. State shall arrange for delivery from Grantee of items that it takes title to. Cost of transportation, if any, shall be borne by State.
- D.15. **DRUG-FREE WORKPLACE CERTIFICATION:** Certification of Compliance: By signing this Grant agreement, Grantee, its contractors or subcontractors hereby certify, under penalty of perjury under the laws of State of California, compliance with the requirements of the Drug-Free Workplace Act of 1990 (Gov. Code, § 8350 et seq.) and have or will provide a drug-free workplace by taking the following actions:
- A. Publish a statement notifying employees, contractors, and subcontractors that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited

and specifying actions to be taken against employees, contractors, or subcontractors for violations, as required by Government Code section 8355.

- B. Establish a Drug-Free Awareness Program, as required by Government Code section 8355 to inform employees, contractors, or subcontractors about all of the following:
 - i. The dangers of drug abuse in the workplace,
 - ii. Grantee's policy of maintaining a drug-free workplace,
 - iii. Any available counseling, rehabilitation, and employee assistance programs, and
 - iv. Penalties that may be imposed upon employees, contractors, and subcontractors for drug abuse violations.
- C. Provide, as required by Government Code section 8355, that every employee, contractor, and/or subcontractor who works under this Grant agreement:
 - i. Will receive a copy of Grantee's drug-free policy statement, and
 - ii. Will agree to abide by terms of Grantee's condition of employment, contract or subcontract.

- D.16. EASEMENTS: Where the Grantee acquires property in fee title or funds improvements to real property already owned in fee by the Grantee using State funds provided through this Grant agreement, an appropriate easement or other title restriction providing for floodplain preservation and agricultural and/or wildlife habitat conservation for the subject property in perpetuity, approved by the State, shall be conveyed to a regulatory or trustee agency or conservation group acceptable to the State. The easement or other title restriction must be in first position ahead of any recorded mortgage or lien on the property unless this requirement is waived by the State.

Where the Grantee acquires an easement under this Agreement, the Grantee agrees to monitor and enforce the terms of the easement, unless the easement is subsequently transferred to another land management or conservation organization or entity with State permission, at which time monitoring and enforcement responsibilities will transfer to the new easement owner.

Failure to provide an easement acceptable to the State may result in termination of this Agreement.

- D.17. FINAL INSPECTIONS AND CERTIFICATION OF REGISTERED PROFESSIONAL: Upon completion of the Project, Grantee shall provide for a final inspection and certification by a California Registered Professional (i.e., Professional Civil Engineer, Engineering Geologist), that the Project has been completed in accordance with submitted final plans and specifications and any modifications thereto and in accordance with this Grant Agreement.

- D.18. GOVERNING LAW: This Grant agreement is governed by and shall be interpreted in accordance with the laws of the State of California.

- D.19. GRANTEE'S RESPONSIBILITIES: Grantee and its representatives shall:

- A. Faithfully and expeditiously perform or cause to be performed all project work as described in Exhibit A and in accordance with Exhibits B and C.
- B. Accept and agree to comply with all terms, provisions, conditions, and written commitments of this Grant agreement, including all incorporated documents, and to fulfill all assurances, declarations, representations, and statements made by Grantee in the application, documents, amendments, and communications filed in support of its request for funding.
- C. Comply with all applicable California, federal, and local laws and regulations.
- D. Implement the Project in accordance with applicable provisions of the law.
- E. Fulfill its obligations under the Grant agreement and be responsible for the performance of the Project.
- F. Obtain any and all permits, licenses, and approvals required for performing any work under this Grant agreement, including those necessary to perform design, construction, or operation and maintenance of the Project. Grantee shall provide copies of permits and approvals to State.
- G. Be solely responsible for design, construction, and operation and maintenance of projects within the work plan. Review or approval of plans, specifications, bid documents, or other construction documents by State is solely for the purpose of proper administration of funds by State and shall not be deemed to relieve or restrict responsibilities of Grantee under this Agreement.

- H. Be solely responsible for all work and for persons or entities engaged in work performed pursuant to this Agreement, including, but not limited to, contractors, subcontractors, suppliers, and providers of services. The Grantee shall be responsible for any and all disputes arising out of its contracts for work on the Project, including but not limited to payment disputes with contractors and subcontractors. The State will not mediate disputes between the Grantee and any other entity concerning responsibility for performance of work.
- D.20. INDEMNIFICATION: Grantee shall indemnify and hold and save the State, its officers, agents, and employees, free and harmless from any and all liabilities for any claims and damages (including inverse condemnation) that may arise out of the Project and this Agreement, including, but not limited to any claims or damages arising from planning, design, construction, maintenance and/or operation of levee rehabilitation measures for this Project and any breach of this Agreement. Grantee shall require its contractors or subcontractors to name the State, its officers, agents and employees as additional insureds on their liability insurance for activities undertaken pursuant to this Agreement.
- D.21. INDEPENDENT CAPACITY: Grantee, and the agents and employees of Grantees, in the performance of the Grant agreement, shall act in an independent capacity and not as officers, employees, or agents of the State.
- D.22. INSPECTION OF BOOKS, RECORDS, AND REPORTS: During regular office hours, each of the parties hereto and their duly authorized representatives shall have the right to inspect and to make copies of any books, records, or reports of either party pertaining to this Grant agreement or matters related hereto. Each of the parties hereto shall maintain and shall make available at all times for such inspection accurate records of all its costs, disbursements, and receipts with respect to its activities under this Grant agreement. Failure or refusal by Grantee to comply with this provision shall be considered a breach of this Grant agreement, and State may withhold disbursements to Grantee or take any other action it deems necessary to protect its interests.
- D.23. INSPECTIONS OF PROJECT BY STATE: State shall have the right to inspect the work being performed at any and all reasonable times during the term of the Grant agreement. This right shall extend to any subcontracts, and Grantee shall include provisions ensuring such access in all its contracts or subcontracts entered into pursuant to its Grant agreement with State.
- D.24. LABOR CODE COMPLIANCE: The Grantee agrees to be bound by all the provisions of the Labor Code regarding prevailing wages and shall monitor all contracts subject to reimbursement from this Agreement to assure that the prevailing wage provisions of the Labor Code are being met. Current Department of Industrial Relations (DIR) requirements may be found at: <http://www.dir.ca.gov/lcp.asp>. For more information, please refer to DIR's *Public Works Manual* at: <https://www.dir.ca.gov/dlse/PWManualCombined.pdf>. The Grantee affirms that it is aware of the provisions of section 3700 of the Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance, and the Grantee affirms that it will comply with such provisions before commencing the performance of the work under this Agreement and will make its contractors and subcontractors aware of this provision.
- D.25. MODIFICATION OF OVERALL WORK PLAN: At the request of the Grantee, the State may at its sole discretion approve non-material changes to the portions of Exhibits A, B, and C which concern the budget and schedule without formally amending this Grant agreement. Non-material changes with respect to the budget are changes that only result in reallocation of the budget and will not result in an increase in the amount of the State Grant agreement. Non-material changes with respect to the Project schedule are changes that will not extend the term of this Grant agreement. Requests for non-material changes to the budget and schedule must be submitted by the Grantee to the State in writing and are not effective unless and until specifically approved by the State's Program Manager in writing.
- D.26. NONDISCRIMINATION: During the performance of this Grant agreement, Grantee and its contractors or subcontractors shall not unlawfully discriminate, harass, or allow harassment against any employee

or applicant for employment because of sex (gender), sexual orientation, gender identity, race, color, ancestry, religion, creed, national origin (including language use restriction), pregnancy, physical disability (including HIV and AIDS), mental disability, medical condition (cancer/genetic characteristics), age (over 40), marital/domestic partner status, and denial of medical and family care leave or pregnancy disability leave. Grantee and its contractors or subcontractors shall ensure that the evaluation and treatment of their employees and applicants for employment are free from such discrimination and harassment. Grantee and its contractors or subcontractors shall comply with the provisions of the California Fair Employment and Housing Act (Gov. Code, § 12990.) and the applicable regulations promulgated there under (Cal. Code Regs., tit. 2, § 11000 et seq.). The applicable regulations of the Fair Employment and Housing are incorporated into this Agreement by reference. Grantee and its contractors or subcontractors shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

Grantee shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Grant agreement.

- D.27. OPINIONS AND DETERMINATIONS: Where the terms of this Grant agreement provide for action to be based upon, judgment, approval, review, or determination of either party hereto, such terms are not intended to be and shall never be construed as permitting such opinion, judgment, approval, review, or determination to be arbitrary, capricious, or unreasonable.
- D.28. PERFORMANCE BOND: Where contractors are used, the Grantee shall not authorize construction to begin until each contractor has furnished a performance bond in favor of the Grantee in the following amounts: faithful performance (100%) of contract value, and labor and materials (100%) of contract value. This requirement shall not apply to any contract for less than \$25,000.00. Any bond issued pursuant to this paragraph must be issued by a California-admitted surety. (Pub. Contract Code, § 7103; Code Civ. Proc., § 995.311.)
- D.29. PRIORITY HIRING CONSIDERATIONS: If this Grant agreement includes services in excess of \$200,000, the Grantee shall give priority consideration in filling vacancies in positions funded by the Grant agreement to qualified recipients of aid under Welfare and Institutions Code section 11200 in accordance with Public Contract Code section 10353.
- D.30. PROHIBITION AGAINST DISPOSAL OF PROJECT WITHOUT STATE PERMISSION: The Grantee shall not sell, abandon, lease, transfer, exchange, mortgage, hypothecate, or encumber in any manner whatsoever all or any portion of any real or other property necessarily connected or used in conjunction with the Project, or with Grantee's service of water, without prior permission of State. Grantee shall not take any action, including but not limited to actions relating to user fees, charges, and assessments that could adversely affect the ability of Grantee meet its obligations under this Grant agreement, without prior written permission of State. State may require that the proceeds from the disposition of any real or personal property be remitted to State.
- D.31. PROJECT ACCESS: The Grantee shall ensure that the State, the Governor of the State, or any authorized representative of the foregoing, will have safe and suitable access to the Project site at all reasonable times during Project construction and thereafter for the term of this Agreement.
- D.32. REMAINING BALANCE: In the event the Grantee does not submit invoices requesting all of the funds encumbered under this Grant Agreement, any remaining funds revert to the State. The State will notify the Grantee stating that the Project file is closed and any remaining balance will be disencumbered and unavailable for further use under this Grant Agreement.
- D.33. REMEDIES NOT EXCLUSIVE: The use by either party of any remedy specified herein for the enforcement of this Grant agreement is not exclusive and shall not deprive the party using such remedy of, or limit the application of, any other remedy provided by law.

- D.34. RETENTION: The State shall withhold ten percent (10%) of the funds, for each project, until the project is complete, and a Final Project Report is approved and accepted by DWR. If a project has multiple Components (within a project), at the State's discretion and upon a written request by the Grantee, any retained amount attributable to a single component may be released when that component is complete and the Final Component Completion Report is approved. Upon approval of the Final Project Report and/or Final Component Completion Report, any retained amounts due to the Grantee will be promptly disbursed to the Grantee, without interest.
- D.35. RIGHTS IN DATA: Grantee agrees that all data, plans, drawings, specifications, reports, computer programs, operating manuals, notes and other written or graphic work produced in the performance of this Grant agreement shall be made available to the State and shall be in the public domain to the extent to which release of such materials is required under the California Public Records Act. (Gov. Code, § 6250 et seq.) Grantee may disclose, disseminate and use in whole or in part, any final form data and information received, collected and developed under this Grant agreement, subject to appropriate acknowledgement of credit to State for financial support. Grantee shall not utilize the materials for any profit-making venture or sell or grant rights to a third party who intends to do so. The State shall have the right to use any data described in this paragraph for any public purpose.
- D.36. SEVERABILITY: Should any portion of this Grant agreement be determined to be void or unenforceable, such shall be severed from the whole and the Grant agreement shall continue as modified.
- D.37. SUSPENSION OF PAYMENTS: This Grant agreement may be subject to suspension of payments or termination, or both if the State determines that:
- A. Grantee, its contractors, or subcontractors have made a false certification, or
 - B. Grantee, its contractors, or subcontractors violates the certification by failing to carry out the requirements noted in this Grant agreement.
- D.38. SUCCESSORS AND ASSIGNS: This Grant agreement and all of its provisions shall apply to and bind the successors and assigns of the parties. No assignment or transfer of this Grant agreement or any part thereof, rights hereunder, or interest herein by the Grantee shall be valid unless and until it is approved by State and made subject to such reasonable terms and conditions as State may impose.
- D.39. TERMINATION BY GRANTEE: Subject to State approval which may be reasonably withheld, Grantee may terminate this Agreement and be relieved of contractual obligations. In doing so, Grantee must provide a reason(s) for termination. Grantee must submit all progress reports summarizing accomplishments up until termination date.
- D.40. TERMINATION FOR CAUSE: Subject to the right to cure under Paragraph 10, "Default Provisions," the State may terminate this Grant agreement and be relieved of any payments should Grantee fail to perform the requirements of this Grant agreement at the time and in the manner herein, provided including but not limited to reasons of default under Paragraph 10, "Default Provisions."
- D.41. TERMINATION WITHOUT CAUSE: The State may terminate this Agreement without cause on 30 days' advance written notice. The Grantee shall be reimbursed for all reasonable expenses incurred up to the date of termination.
- D.42. THIRD PARTY BENEFICIARIES: The parties to this Agreement do not intend to create rights in, or grant remedies to, any third party as a beneficiary of this Agreement, or any duty, covenant, obligation or understanding established herein.
- D.43. TIMELINESS: Time is of the essence in this Grant Agreement.

- D.44. TRAVEL : Only ground transportation and lodging are eligible for grant reimbursement. Per diem costs will not be eligible for grant reimbursement. Any reimbursement for necessary travel shall be at rates not to exceed those set by the California Department of Human Resources. These rates may be found at: <http://www.calhr.ca.gov/employees/Pages/travel-reimbursements.aspx>. Reimbursement will be at the State travel amounts that are current as of the date costs are incurred. No travel outside of the project sponsor's service area shall be reimbursed unless prior written authorization is obtained from the State.
- D.45. UNION ORGANIZING: Grantee, by signing this Grant agreement, hereby acknowledges the applicability of Government Code sections 16645 through 16649 to this Grant Agreement. Furthermore, Grantee, by signing this Grant Agreement, hereby certifies that:
- A. No State funds disbursed by this Grant agreement will be used to assist, promote, or deter union organizing.
 - B. Grantee shall account for State funds disbursed for a specific expenditure by this Grant agreement to show those funds were allocated to that expenditure.
 - C. Grantee shall, where State funds are not designated as described in (b) above, allocate, on a pro rata basis, all disbursements that support the program.
 - D. If Grantee makes expenditures to assist, promote, or deter union organizing, Grantee will maintain records sufficient to show that no State funds were used for those expenditures and that Grantee shall provide those records to the Attorney General upon request.
- D.46. VENUE: The State and the Grantee hereby agree that any action arising out of this Agreement shall be filed and maintained in the Superior Court in and for the County of Sacramento, California, or in the United States District Court in and for the Eastern District of California. The Grantee hereby waives any existing sovereign immunity for the purposes of this Agreement.
- D.47. WAIVER OF RIGHTS: None of the provisions of this Grant Agreement shall be deemed waived unless expressly waived in writing. It is the intention of the parties here to that from time to time either party may waive any of its rights under this Grant agreement unless contrary to law. Any waiver by either party of rights arising in connection with the Grant agreement shall not be deemed to be a waiver with respect to any other rights or matters, and such provisions shall continue in full force and effect.

DEPARTMENT OF WATER RESOURCES715 P STREET, 7th FLOOR P.O. BOX 942836
SACRAMENTO, CA 94236-0001

APR 19 2022

April 18, 2022

RE: Contractor and Grantee Compliance with Economic Sanctions Imposed in
Response to Russia's Actions in Ukraine

Dear Contractor or Grantee:

On March 4, 2022, Governor Gavin Newsom issued Executive Order N-6-22 (EO) regarding sanctions in response to Russian aggression in Ukraine. The EO is located at <https://www.gov.ca.gov/wp-content/uploads/2022/03/3.4.22-Russia-Ukraine-Executive-Order.pdf>.

The EO directs all agencies and departments that are subject to the Governor's authority to take certain immediate steps, including notifying all contractors and grantees of their obligations to comply with existing economic sanctions imposed by the U.S. government in response to Russia's actions in Ukraine, as well as any sanctions imposed under state law.

This correspondence serves as a notice under the EO that as a contractor or grantee, compliance with the economic sanctions imposed in response to Russia's actions in Ukraine is required, including with respect to, but not limited to, the federal executive orders identified in the EO and the sanctions identified on the U.S. Department of the Treasury website (<https://home.treasury.gov/policy-issues/financial-sanctions/sanctions-programs-and-country-information/ukraine-russia-related-sanctions>). Failure to comply may result in the termination of contracts or grants, as applicable.

Please note that for any agreements or grants valued at \$5 million or more, a separate notification will be sent outlining additional requirements specified under the EO.

Sincerely,

Rhonda Pascual

Rhonda Pascual
Manager, Division of Business Services
Department of Water Resources

2-E PROJECT SPECIFIC PLANS AND SPECIFICATIONS

1. Grace Way Well – Motor Control Center Housing Specifications
2. Grace Way Well – Electrical Conduit Specifications
3. Grace Way Well – Ornamental Fencing and Gate Specifications
4. Grace Way Well – Landscaping Specifications
5. Grace Way Well – Storm and Sanitary Piping Specifications

MOTOR CONTROL CENTER HOUSING SPECIFICATIONS

1. 03 20 00 - Concrete Reinforcement
2. 03 60 00 - Grout
3. 04 22 00 - Concrete Masonry
4. 05 09 00 – Concrete and Masonry Anchors
5. 05 58 00 - Sheet Metal Fabrications
6. 06 17 80 – Metal Plate Connection to Wood Truss
7. 07 60 00- Flashing and Sheet Metal
8. 07-61 10- Metal Roofing Panels
9. 07 62 00 – Flashing
10. 07 92 00 – Joint Sealant
11. 08 11 00 – Doors
12. 08 71 00 – Finish Hardware
13. 08 91 00 – Louves
14. 09 91 00 - Painting

SECTION 03 20 00

CONCRETE REINFORCEMENT AND REINFORCEMENT SUPPORTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Materials, fabrication, placement, and tolerances of reinforcement and reinforcement accessories.

1.02 REFERENCES

- A. ASTM International (ASTM) Standard Specifications:
 - 1. ASTM A143 Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
 - 2. ASTM A572 High-Strength Low-Alloy Columbium-Vanadium Structural Steel
 - 3. ASTM A615 Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 - 4. ASTM A706 Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement
 - 5. ASTM A1064 Carbon-Steel Wire and Welded Wire, Plain and Deformed, for Concrete
 - 6. ASTM E329 Agencies Engaged in Construction Inspection, Testing, or Special Inspection
- B. American Concrete Institute (ACI):
 - 1. Details and Detailing of Concrete Reinforcement (ACI 315).
- C. Concrete Reinforcing Steel Institute (CRSI): Manual of Standard Practice (CRSI Manual).
- D. American Welding Society (AWS): D1.4 Structural Welding Code - Reinforcing Steel (AWS D1.4).

1.03 SUBMITTALS

- A. Product Data:
 - 1. Bar supports and chairs.
 - 2. Mechanical bar connectors, including ICC Reports.
 - 3. Certified mill test results.
 - 4. Tests on unidentified bars.
- B. Shop Drawings:
 - 1. Bar and wire fabric layouts.
 - 2. Bar bending diagrams.
 - 3. Placing drawings showing fabrication dimensions and locations for placement of reinforcement and reinforcement supports including the length and location of lap splices and mechanical connector locations.
 - 4. Accessories and inserts layout.

- C. Quality Assurance/Control Submittals:
 - 1. Welding: Description of reinforcement weld locations, chemical analysis of reinforcement, welding procedures, and welder qualifications.
 - 2. Submit a request to relocate any reinforcement that exceeds placement tolerances.

1.04 QUALITY ASSURANCE

- A. Testing agencies that perform testing services on reinforcing steel shall meet the requirements of ASTM E329.
- B. Material Tests: Not required for bars, wire fabric rolls, or sheets delivered in bundles from the mill and tagged with valid Identification Certificate.
 - 1. Unidentified Bars: Test samples from each 5 tons or fraction thereof for each size. If already delivered to site, test additional samples from each day of planned concrete placement. Perform one tension and one bend test from each sample for each size.
 - 2. Test standard: ASTM A615.
 - 3. Testing Laboratory: Selected by City, to take samples and perform tests. Costs paid by Contractor.
 - 4. Unidentified Wire Fabric: Not acceptable.
- C. Standard: CRSI Manual, except as otherwise indicated or specified.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Prevent permanent bending and protect bar surfaces from contact with soil, oil, or other materials that may decrease bond to concrete.
- B. Bundle reinforcement and tag with suitable identification to simplify sorting and placing. Transport and store at site so material is not damaged. Store reinforcement off ground, place under cover, and keep clean. Store welded fabric in flat sheets, not rolls. Keep an adequate supply of reinforcement at site to avoid delays.

PART 2 - PRODUCTS

2.01 REINFORCING BARS

- A. General: Deformed bars, ASTM A615, Grade 60.
- B. Dowels: All dowels are deformed bars unless shown otherwise on the Drawings.
 - 1. Deformed bars: ASTM A615, Grade 60.
 - 2. Threaded bars: ASTM A572, Grade 50.
- C. Low-Alloy: Deformed bars, ASTM A706, Grade 60, where welded bars are shown on the Drawings.

2.02 SUPPORTS AND ACCESSORIES

- A. Secure and support the reinforcement within specified tolerances. Conform to CRSI Manual Chapter 3, for Types SB, BB, BC, JC, HC, CHC, and others of standard types as required. Use Class "1" plastic-coated chairs and spacers at waterbearing surfaces, roofs of waterbearing structures, and at all interior or exterior surfaces exposed to view or weather in the completed structure. Plastic thickness of 3/32-inch or greater at points of contact with formwork and extend the

plastic along the wire at least ½-inch from the point of contact with the formwork. Precast concrete block supports with embedded wire ties are not acceptable.

- B. Use precast concrete supports that have a surface area of not less than 4 inches² and have a compressive strength equal to or greater than specified compressive strength of concrete being placed. Water absorption and porosity of precast concrete supports equal to or less than water absorption and porosity of concrete being placed. Use precast concrete block supports with embedded wire ties or dowels for placement on grade or on membranes. Cast the blocks with concrete equal in strength, cement type and aggregate to the parent concrete.
- C. Do not use aluminum or stainless steel supports or accessories.

2.03 FABRICATION

- A. General: CRSI Manual Chapters 6 and 7, including tolerances.
- B. Splice, development and embedment lengths: Unless otherwise noted on the Drawings, furnish bars with lap lengths equivalent to ACI 318, Section 12, Class B splices for the specified concrete strength, bar size and location.
- C. Bending and Forming: Fabricate bars of indicated size and accurately form to shapes and lengths indicated and required. Fabricate by methods not injurious to materials. Bend reinforcement cold. Fabricate reinforcement in accordance with fabricating tolerances of ACI 117. Reject bars with kinks or bends not scheduled.
- D. Welding: When welding of reinforcement is approved by the Engineer, comply with the requirements of AWS D1.4. Do not weld crossing bars (tack welding) for assembly of reinforcement, supports, or embedded items.
- E. Concrete Cover: Detail and fabricate the reinforcement to provide specified cover to outer edge of rebars and other installed items.
- F. Dowels:
 - 1. Provide deformed reinforcing bar dowels at all construction joints, unless noted otherwise.
 - 2. Provide smooth or threaded dowels where shown on Drawings.
 - 3. Provide same dowel size and spacing as the reinforcing to which they are spliced, unless noted otherwise.
 - 4. If cutting of bars is performed after coating has been applied, repair the bar end and any damaged surface with approved repair material.

2.04 SOURCE QUALITY CONTROL

- A. Testing agencies that perform testing services on reinforcing steel shall meet the requirements of ASTM E329.
- B. Verify bend tolerances are not exceeded.
- C. Verify bar end cuts are within tolerance when mechanical connectors are to be used.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: CRSI Manual Chapter 8 including placement tolerances. No reduction of concrete cover is allowable for bars at concrete surfaces exposed in liquid or water-containing structures.
1. Cleaning: Before placing reinforcing, and again before concrete is placed, clean reinforcement of loose mill scale, dried concrete, oil, or other materials deleterious to bond. Do not allow form coatings, release agents, bond breaker, or curing compound to contact reinforcement.
 2. Placement: Place, support, and fasten reinforcement as indicated. Do not exceed the placing tolerances specified in ACI 117. Do not reduce cover requirements for placing tolerances. When necessary to move reinforcement beyond the specified placing tolerances to avoid interference with other reinforcement, conduits, or embedded items, submit the resulting arrangement of reinforcement for review. Accurately place reinforcement and securely wire tie in position, at an adequate number of points, where bars cross so as to prevent displacement. Tie stirrups to bars at both top and bottom. Bend ends of tie wire inward allowing no encroachment into the concrete cover.
 3. Concrete cover: Provide cover for reinforcement as shown on Drawings. Minimum concrete cover for reinforcement for cast-in-place concrete is shown in the table below for the exposure condition noted. Provide minimum cover to the outer edge of bar spacers, hangers, and like items. For bundled bars, minimum concrete cover shall be equal to the equivalent diameter of the bundle but need not be greater than 2 inches, except the minimum cover shall not be less than specified in the table below. Base the equivalent diameter of the bundle on a single bar of a diameter derived from the equivalent total area.

Exposure Condition for Reinforcement	Min. Cover
A. Concrete cast against and permanently exposed to earth	3-inch
B. Concrete exposed to earth, liquid, weather, or bearing on work mat or slabs supporting earth cover	
Slabs and Joists	2-inch
Beams and Columns:	
Stirrups, spirals, and ties	2-inch
Walls	2-inch
Footings and Base Slabs:	
Formed surfaces	2-inch
Top of footings and base slabs	2-inch

4. Reinforcement supports: CRSI Manual, Chapter 3. Unless noted otherwise on Drawings, use the following reinforcement supports:
 - a. Place reinforcement supported from the ground or mud mat on precast concrete reinforcement supports.
 - b. Place uncoated reinforcement supported from formwork on reinforcement supports made of concrete, metal, or plastic.
 - c. Place zinc-coated (galvanized) reinforcement supported from formwork on wire reinforcement supports that are galvanized, coated with dielectric material, or made of dielectric material.

- d. Reinforcement and embedded steel items used with zinc-coated (galvanized) reinforcement shall be zinc-coated (galvanized) or coated with nonmetallic materials.
- 5. Field bending: Not permitted, except where specifically shown, or approved.
- 6. Bar spacing: Between parallel bars, no less than 1-1/2 times the maximum aggregate size and in no case less than 1-1/2 inches. At splices, bundle and wire together bars to accomplish this.
- 7. Welded wire reinforcement: Install necessary supports and chairs to hold in place during concrete pours. Straighten reinforcement to lay in flat plane and bend reinforcement to fit work. Tie every other wire at laps. For slabs on soil, extend welded wire reinforcement to within 2 inches of the concrete edge. Lap edges and ends of welded wire reinforcement sheets a minimum of 12 inches. Do not extend welded wire reinforcement through contraction joints. Support welded wire reinforcement during placing of concrete to ensure required positioning in the slab. Do not place welded wire reinforcement on grade and subsequently raise into position in concrete.
- 8. Column dowels: Furnish and use templates for placement of column dowels.
- 9. Welding of reinforcing: Proceed after continuous inspection has been authorized. Welding procedure: Satisfy AWS D1.4.
- 10. Smooth dowels: Straight dowels at movement joints free of loose rust or scale. Include on dowels used at expansion joints an expansion cap at one end designed to allow at least 1-1/2 inches of expansion. Use an acceptable bond breaker on the dowel on one side of the movement joint.
- 11. Reinforcement termination: Where reinforcement does not extend through a joint, terminate the reinforcement 2 inches from the face of the joint.

3.02 FIELD QUALITY CONTROL

- A. Inspect all reinforcement installations. Provide 48 hours notice for inspection before concrete placement.
- B. Verify placement tolerances are not exceeded.
- C. Mechanical Connectors: Install favorably reviewed products, following the Manufacturer's recommendations, under continuous inspection.
- D. Welding Reinforcement: Perform only when approved by the Engineer and only under continuous inspection. Notify the Construction Manager at least 48 hours in advance of any procedure involving welding.
- E. Coordinate access and notify special inspector 48 hours in advance of any concrete placement so that special inspection and testing may be performed in accordance with the Special Inspection and Testing Schedule.

END OF SECTION

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SECTION 03 60 00

GROUTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Non-shrink cementitious grout (non-shrink grout).
 - 2. Non-shrink epoxy grout.
 - 3. Cement grout.
 - 4. Concrete grout.

1.02 REFERENCES

- A. ASTM International (ASTM):
 - 1. C531 Standard Test Method for Linear Shrinkage and Coefficient of Thermal Expansion of Chemical Resistant Mortars, Grouts and Monolithic Surfacing and Polymer Concretes.
 - 2. C827 Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
 - 3. 1107 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink).
 - 4. D695 Standard Test Method for Compressive Properties of Rigid Plastics.
- B. U.S. Army Corps of Engineers Standard (CRD):
 - 1. CRD C-621 Corps of Engineers Specification for Non-shrink Grout.

1.03 SUBMITTALS

- A. Product Data: Submit product data for all grout products specified in Part 2 of this Section. Product data shall include:
 - 1. Catalog information,
 - 2. Technical data,
 - 3. Storage requirements,
 - 4. Product life,
 - 5. Working time after mixing,
 - 6. Temperature considerations,
 - 7. Conformity to required ASTM Standards and Material Safety Data Sheet (MSDS),
 - 8. Type and brand of the cement,
 - 9. Gradation of the fine aggregate, and
 - 10. Proposed admixtures and the proposed mix of the grout for non-packaged mixes.
 - 11. Concrete grout: The submittal shall include data as required for concrete as delineated in Section 03 30 00 and for fiber reinforcement as delineated in Section 03 20 00. This includes the mix design, constituent quantities per cubic yard and the water/cement ratio.
- B. Samples:
 - 1. Field samples for color control, if a color match is required.

- C. Quality Control:
 - 1. Laboratory Test Reports:
 - a. Submit laboratory test data as required under Section 03 30 00 for concrete to be used as concrete grout.
 - 2. Qualifications:
 - a. Submit documentation that grout manufacturer has at least 3 years experience in the production and use of the proposed grouts which they will supply.

1.04 QUALITY CONTROL

- A. Qualifications:
 - 1. Grout manufacturer shall have a minimum of 3 years experience in the production and use of the type of grout proposed for the work.

1.05 QUALITY ASSURANCE

- A. Special Inspection shall be completed by the Engineer.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the jobsite in original, unopened packages, clearly labeled with the manufacturer's name, product identification, batch numbers and printed instructions.
- B. Store materials in full compliance with the manufacturer's recommendations. Total storage time from date of manufacture to date of installation shall be limited to 12 months or the manufacturer's recommended storage time, whichever is less.
- C. Material which becomes damp or otherwise unacceptable shall be immediately removed from the site and replaced with acceptable material at no additional cost to the City.
- D. Non-shrink cement-based grouts shall be delivered as preblended, prepackaged mixes requiring only the addition of water.
- E. Non-shrink epoxy grouts shall be delivered as premeasured, prepackaged, three component systems requiring only blending as directed by the manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Non-shrink Cementitious Grout (Non-shrink Grout):
 - 1. Non-shrink cementitious grouts shall meet or exceed the requirements of ASTM C1107, Grades B or C and CRD C-621. Grouts shall be portland cement based, contain a pre-proportioned blend of selected aggregates and shrinkage compensating agents and shall require only the addition of water. Non-shrink cementitious grouts shall not contain expansive cement or metallic particles. The grouts shall exhibit no shrinkage when tested in conformity with ASTM C827.
 - a. General purpose non-shrink cementitious grout shall conform to the standards stated above and shall be SikaGrout 212 by Sika Corp.; Eucon NS by The Euclid Chemical Co.; Five Star Grout by Five Star Products, Inc.; or approved equal.

- b. Flowable (Precision) non-shrink cementitious grout shall conform to the standards stated above and shall be Hi-Flow Grout by the Euclid Chemical Co.; SikaGrout 212 by Sika Corp.; Five Star Grout by Five Star Products Inc.; or approved equal.
- B. Non-shrink Epoxy Grout:
 - 1. Non-shrink epoxy-based grout shall be a pre-proportioned, three-component, 100% solids system consisting of epoxy resin, hardener, and blended aggregate. It shall have a compressive strength of 14,000 psi in 7 days when tested in conformity with ASTM D695 and have a maximum thermal expansion of 30 x 10⁻⁶-inch per inch per degree F when tested in conformity with ASTM C531. The grout shall be Five Star HP Epoxy Grout by Five Star Products.; Sikadur 42 Grout-Pak by Sika Corp.; E3-G Epoxy Grout by the Euclid Chemical Co.; or approved equal.
- C. Cement Grout:
 - 1. Cement grouts shall be a mixture of one part Portland Cement conforming to ASTM C150, Types I, II, or III and 1 to 2 parts sand conforming to ASTM C33 with sufficient water to place the grout. The water content shall be sufficient to impart workability to the grout but not to the degree that it will allow the grout to flow.
- D. Concrete Grout:
 - 1. Concrete grout shall conform to the requirements of Section 03 30 00 except as specified herein. Proportion with Type II Portland Cement, pozzolan, coarse and fine aggregates, water, water reducer and air entraining agent to produce a mix having an average strength of 4000 psi at 28 days (4500 psi nominal strength). Coarse aggregate size shall be 3/8-inch maximum. Slump shall not exceed 5 inches. Minimum cement content shall be 540 lbs per cubic yard and maximum water-to-cement ratio shall be 0.45.
- E. Water:
 - 1. Potable water, free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.
- F. Grout for Grouting of Masonry:
 - 1. See Specification Section 04 22 00.
- G. Like materials in areas of common viewing shall be the products of one manufacturer or supplier in order to provide standardization of appearance. Baseplate grout thicknesses are typically shown on the Drawings; confirm that the selected grout product is recommended for the grout thicknesses shown.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Place grout over cured concrete that has attained its full design strength unless otherwise approved by the Engineer.
- B. Concrete surfaces to receive grout shall be clean and sound; free of ice, frost, dirt, grease, oil, curing compounds, laitance and paints and free of all loose material or foreign matter which may affect the bond or performance of the grout.
- C. Roughen concrete surfaces by chipping, sandblasting, or other mechanical means to ensure bond of the grout to the concrete. Remove loose or broken concrete.

Irregular voids or projecting coarse aggregate need not be removed if they are sound, free of laitance and firmly embedded into the parent concrete.

1. Air compressors used to clean surfaces in contact with grout shall be the oilless type or equipped with an oil trap in the airline to prevent oil from being blown onto the surface.
- D. Remove all loose rust, oil or other deleterious substances from metal embedments or bottom of baseplates prior to the installation of the grout.
- E. Concrete surfaces shall be washed clean and then kept moist for at least 24 hours prior to the placement of cementitious or cement grout. Saturation may be achieved by covering the concrete with saturated burlap bags, use of a soaker hose, flooding the surface, or other method acceptable to the Engineer. Upon completion of the 24-hour period, visible water shall be removed from the surface prior to grouting. The use of an adhesive bonding agent in lieu of surface saturation shall only be used when approved by the Engineer for each specific location of grout installation.
- F. Epoxy-based grouts do not require the saturation of the concrete substrate. Surfaces in contact with epoxy grout shall be completely dry before grouting.
- G. Construct grout forms or other leakproof containment as required. Forms shall be lined or coated with release agents recommended by the grout manufacturer. Forms shall be of adequate strength, securely anchored in place and shored to resist the forces imposed by the grout and its placement.
 1. Forms for epoxy grout shall be designed to allow the formation of a hydraulic head and shall have chamfer strips built into forms.
- H. Level and align the structural or equipment bearing plates in accordance with the structural requirements and the recommendations of the equipment manufacturer.
- I. Equipment shall be supported during alignment and installation of grout by shims, wedges, blocks or other approved means. The shims, wedges and blocking devices shall be prevented from bonding to the grout by appropriate bond breaking coatings and removed after grouting unless otherwise approved by the Engineer.

3.02 INSTALLATION – GENERAL

- A. Mix, apply and cure products in strict compliance with the manufacturer's recommendations and this Section.
- B. Have sufficient manpower and equipment available for rapid and continuous mixing and placing. Keep all necessary tools and materials ready and close at hand.
- C. Maintain temperatures of the foundation plate, supporting concrete, and grout between 40° and 90° F during grouting and for at least 24 hours thereafter or as recommended by the grout manufacturer, whichever is longer. Take precautions to minimize differential heating or cooling of baseplates and grout during the curing period.
- D. Take special precautions for hot weather or cold weather grouting as recommended by the manufacturer when ambient temperatures and/or the temperature of the materials in contact with grout are outside of the 60° and 90° F range.

- E. Install grout in a manner which will preserve the isolation between the elements on either side of the joint where grout is placed in the vicinity of an expansion or control joint.
- F. Continue all existing underlying expansion, control and construction joints through the grout.

3.03 INSTALLATION – CEMENT GROUTS AND NON-SHRINK CEMENTITIOUS GROUTS

- A. Mix in accordance with manufacturer's recommendations. Do not add cement, sand, pea gravel or admixtures without prior approval by the Engineer.
- B. Avoid mixing by hand. Mixing in a mortar mixer (with moving blades) is required if recommended by the manufacturer. Pre-wet the mixer and empty excess water. Add premeasured amount of water for mixing, followed by the grout. Begin with the minimum amount of water recommended by the manufacturer and then add the minimum additional water required to obtain workability. Do not exceed the manufacturer's maximum recommended water content.
- C. Placements greater than 3-inch in depth shall include the addition of clean, washed pea gravel to the grout mix when approved by the manufacturer. Comply with the manufacturer's recommendations for the size and amount of aggregate to be added.
- D. Place grout into the designated areas in a manner which will avoid segregation or entrapment of air. Do not vibrate grout to release air or to consolidate the material. Placement shall proceed in a manner which will ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.
- E. Place grout rapidly and continuously to avoid cold joints. Do not place cement grouts in layers. Do not add additional water to the mix (retemper) after initial stiffening.
- F. Just before the grout reaches its final set, cut back the grout to the substrate at a 45-degree angle from the lower edge of bearing plate unless otherwise approved by the Engineer. Finish this surface with a wood float (brush) finish.
- G. Begin curing immediately after form removal, cutback, and finishing. Keep grout moist and within its recommended placement temperature range for at least 24 hours after placement or longer if recommended by the manufacturer. Saturate the grout surface by use of wet burlap, soaker hoses, ponding or other approved means. Provide sunshades as necessary. If drying winds inhibit the ability of a given curing method to keep grout moist, erect wind breaks until wind is no longer a problem or curing is finished.

3.04 INSTALLATION – NON-SHRINK EPOXY GROUTS

- A. Mix in accordance with the procedures recommended by the manufacturer. Do not vary the ratio of components or add solvent to change the consistency of the grout mix. Do not overmix. Mix full batches only to maintain proper proportions of resin, hardener and aggregate.
- B. Monitor ambient weather conditions and contact the grout manufacturer for special placement procedures to be used for temperatures below 60° or above 90° F.

- C. Place grout into the designated areas in a manner which will avoid trapping air. Placement methods shall ensure the filling of all spaces and provide full contact between the grout and adjoining surfaces. Provide grout holes as necessary.
- D. Minimize "shoulder" length (extension of grout horizontally beyond base plate). In no case shall the shoulder length of the grout be greater than the grout thickness.
- E. Finish grout by puddling to cover all aggregate and provide a smooth finish. Break bubbles and smooth the top surface of the grout in conformity with the manufacturer's recommendations.
- F. Epoxy grouts are self-curing and do not require the application of water. Maintain the formed grout within its recommended placement temperature range for at least 24 hours after placing, or longer if recommended by the manufacturer.

3.05 INSTALLATION - CONCRETE GROUT

- A. Inspect slabs finished under Section 03 35 00 and scheduled to receive concrete grout. Protect and keep the surface clean until placement of concrete grout.
- B. Clean and roughen surface in accordance with preparation instructions above. Do not flush debris into structure drain piping.
- C. Saturate the concrete surface in accordance with instructions above. Place cement slurry immediately ahead of the concrete grout so that the slurry is moist when the grout is placed. Work the slurry over the surface with a broom until it is coated with approximately 1/16 to 1/8-inch thick cement paste. A bonding grout composed of 1-part portland cement, 1.5 parts fine sand, an approved bonding admixture and water, mixed to achieve the consistency of thick paint, may be substituted for the cement slurry.
- D. Place concrete grout to final grade using the scraper mechanism as a guide for surface elevation and to eliminate high and low spots. Unless specifically approved by the equipment manufacturer, mechanical scraper mechanisms shall not be used as a finishing machine or screed.
- E. Provide grout control joints as indicated on the Drawings.
- F. Steel trowel finish as specified in Section 03 35 00. Cure the concrete grout as specified for cast-in-place concrete in Section 03 30 00.

3.06 SCHEDULE

- A. The following list indicates where the particular types of grout are to be used:
 1. General purpose non-shrink cementitious grout: Use at all locations where non shrink grout is called for on the Drawings except for base plates greater in area than 3-foot wide by 3-foot long and except for the setting of anchor rods, anchor bolts or reinforcing steel in concrete.
 2. Flowable non-shrink cementitious grout: Use under all base plates greater in area than 3-foot by 3-foot. Use at all locations indicated to receive flowable non-shrink grout by the Drawings. The Contractor, at his/her option and convenience, may also substitute flowable non-shrink grout for general purpose non-shrink cementitious grout.
 3. Non-shrink epoxy grout: Use for the setting of anchor rods, anchor bolts and reinforcing steel in concrete and for all locations specifically indicated to receive epoxy grout.
 4. Cement grout: Cement grout may be used for grouting of incidental base plates for structural and miscellaneous steel such as post base plates for

platforms, or equipment, etc. It shall not be used when non-shrink grout is specifically called for on the Drawings or for grouting of primary structural steel members such as columns and girders.

5. Concrete grout: Use at all locations indicated on the Drawings to receive concrete grout.

3.07 FIELD QUALITY CONTROL

A. Field Testing:

1. Field testing and inspection services other than Special Inspection required shall be provided by the Contractor. The Contractor shall complete the sampling of materials and shall provide any ladders, platforms, etc., for access to the work. The methods of testing shall comply in detail with the applicable ASTM Standards.
2. The field testing of concrete grout shall be as specified for concrete in Section 03 30 00.

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SECTION 04 22 00

CONCRETE MASONRY UNITS

1.01 SUMMARY

- A. This Section is applicable for manufactured concrete masonry units (CMU or Masonry) and reinforced masonry construction for both non-load bearing and load-bearing structures, including the intended use of concrete masonry assemblies with grout and mortar.

1.02 REFERENCES

- A. ASTM International (ASTM):
1. A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 2. A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 3. C55 Standard Specification for Concrete Building Brick
 4. C67 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
 5. C90 Standard Specification for Loadbearing Concrete Masonry Units
 6. C91 Standard Specification for Masonry Cement
 7. C109 Standard Test Method for Compressive Strength of Hydraulic-Cement Mortars
 8. C129 Standard Specification for Nonloadbearing Concrete Masonry Units
 9. C140 Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
 10. C143 Standard Test Method for Slump of Hydraulic-Cement Concrete
 11. C144 Standard Specification for Aggregate for Masonry Mortar
 12. C150 Standard Specification for Portland Cement
 13. C207 Standard Specification for Hydrated Lime for Masonry Purposes
 14. C270 Standard Specification for Mortar for Unit Masonry
 15. C331 Specification for Lightweight Aggregates for Concrete Masonry Units
 16. C341 Standard Practice for Preparation and Conditioning of Cast Drilled, or Sawed Specimens of Hydraulic-Cement Mortar and Concrete Used for Length Change Measurements
 17. C404 Standard Specification for Aggregate for Masonry Grout
 18. C426 Standard Test Method for Drying Shrinkage of Concrete Masonry Units
 19. C476 Standard Specification for Grout for Masonry
 20. C482 Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement Paste
 21. C780 Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
 22. C920 Standard Specification for Elastomeric Joint Sealant
 23. C926 Standard Specification for Application of Portland Cement-Based Plaster
 24. C1019 Standard Test Method for Sampling and Testing Grout
 25. C1072 Standard Tests Method for Measurements of Masonry Flexural Bond Strength

- 26. C1093 Standard Practice for Accreditation of Testing Agencies for Masonry
- 27. C1314 Standard Test Method for Compressive Strength of Masonry Prisms
- 28. C1364 Standard Specification for Architectural Cast Stone
- 29. C1586 Standard Guide for Quality Assurance of Mortars
- 30. C1611 Standard Test Method for Slump Flow of Self-Consolidating Concrete
- 31. C1634 Standard Specification for Concrete Facing Brick
- 32. D75 Practice for Aggregates Sampling
- 33. D1056 Standard Specification for Flexible Cellular Materials – Sponge or Expanded Rubber
- 34. E514 Standard Test Method for Water Penetration and Leakage Through Masonry
- 35. E518 Standard Test Methods for Flexural Bond Strength of Masonry
- B. IAPMO-UES International Association of Plumbing and Mechanical Officials (IAPMO): Uniform Evaluation Services (UES).
- C. ICC-ESR International Code Council (ICC): Evaluation Service Reports (ESR).
- D. IMIAC International Masonry Industry All Weather Council (IMIAC): Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.
- E. International Code Council (ICC) Evaluation Service, Acceptance Criteria (AC) for:
 - 1. AC 01 Mechanical Anchors in Cracked and Uncracked Masonry Elements
 - 2. AC 58 Adhesive Anchors in Cracked and Uncracked Masonry Elements
 - 3. AC 60 Anchors in Unreinforced Masonry Elements
 - 4. AC 106 Predrilled Fasteners (Screw Anchors) in Masonry
- F. TMS 602 Building Code Requirements and Specifications for Masonry Structures, The Masonry Society (ACI 530.1), 2016

1.03 SUBMITTALS

- A. Product Data and Procedures:
 - 1. Fully describe every item proposed for use. Manufacturer's technical information for materials, joints, systems, mixing, installation, grout placement plan, curing procedures, and waterproofing procedures.
 - 2. Include procedures for Cold Weather Masonry Construction. Masonry construction in cold weather shall comply with TMS 602.
 - 3. Include Procedures for Hot Weather Masonry Construction. Masonry construction in hot weather shall comply with TMS 602.
- B. Shop Drawings for Reinforcement in CMU:
 - 1. Submit shop drawings for the project before on-site construction begins. The drawings shall be organized by structure and submitted as a complete set for review.
 - 2. Shop drawings shall be drawn to scale and show dimensions and elevations of all walls, beams, lintels, with reinforcing details, laps, hooks, reinforcing type and sizes, material grades, embedments, penetrations and openings, masonry control joints (if applicable), masonry contraction joints (if applicable), anchors, and ties.

3. Reinforcing steel certifications of mill analysis, tensile, and bend tests for all reinforcing bars that show compliance with the Contract Documents.
 4. Shop drawings shall be coordinated by the Contractor with respective subcontractors whose items that require embedment into concrete masonry units.
- C. Information for Grout and Mortar Mix Design:
1. Manufacturer's data and descriptive literature for each type of masonry premixed mortar, masonry cement, and grout. Clearly mark the data to indicate what item and quantity the Contractor intends to provide. Data shall show conformance to the specified requirements and the Contractor's proposed usage.
 2. Mortar mix design indicating types and proportions of materials in accordance with ASTM C270.
 3. Grout mix design indication types and proportions of materials in accordance with ASTM C476.
 4. Proportions of all the components consistent with the tested mix to be used for this project.
 5. Material mill certificates for the cement.
 6. Fly ash certification and chemical analysis.
 7. Admixtures certifications (if applicable), including the chloride ion content.
 8. Aggregate gradation and certification for mortar and grout.
 9. Lime certification.
 10. Strength test results accordance with this Section.
- D. Samples of CMU:
1. Submit color charts showing manufacturer's complete line of standard color for concrete masonry units and mortar.
 2. 2-inch by 2-inch (50mm by 50mm) minimum physical samples of colors and textures chosen by the Owner's Representative. The Owner's Representative will use the physical samples to select the colors for the Quality Control sample.
- E. Anchorage to Masonry:
1. Calculations for deferred submittals associated with anchorage to masonry shall be sealed and signed by a Professional Civil or Structural Engineer licensed to practice in the State where the project is being constructed. All calculations shall be in accordance with the Contract Documents, reference Structural Drawing Sheet S001 for criteria and Specification Section 01 87 13 for structural design requirements.
- F. Test Reports and Information:
1. Documentation from a certified lab agency that the combined masonry assemblage in accordance with the Unit Strength Test and the Contract Documents. Submitted documentation from a certified lab agency. All proposed proportions to be used on site shall be consistent with the certified testing report information.
 2. Testing reports or information from the mortar and grout. Grouted masonry shall demonstrate compliance with Article 2.2 of TMS 602 and the Contract Documents.
- G. Quality Assurance and Quality Control Submittals:
1. Test Reports for concrete masonry units, grout, and mortar in accordance with the Contract Documents.

2. Manufacturer's certification that the concrete masonry units were manufactured and cured for 28 days prior to delivery.
3. Certificates for aggregate testing and compliance with the Contract Documents.
4. Certified efflorescence testing reports for concrete masonry units in accordance with ASTM C67.
5. Evaluation Reports: Submit the current and relative ICC-ESR or IAPMO-UES reports used in the design of mechanical or adhesive attachment of components and other structural elements.

1.04 QUALITY ASSURANCE

- A. Unit Strength Testing:
 1. Sampling and testing reports of concrete masonry units in accordance with ASTM C140 to verify strength and conformance with ASTM C90. Submitted testing shall demonstrate compliance of the combined masonry assemblage, net area compressive strength required at 28 days. Submitted testing reports shall not be less than 12 months old.
 2. Submit a procedure that demonstrates the thickness of bed joints will not exceed 5/8".
 3. Sampling and testing reports shall be submitted prior to construction. Submit test results on three units.
 4. The testing agency that provides the certified test results shall be qualified in accordance with ASTM C1093.
- B. Shrinkage: Provide certified test results for concrete masonry unit shrinkage in accordance with ASTM C426. The maximum linear shrinkage of 0.065% for the average of three units from saturated to oven dry conditions. The testing agency that provides the certified test results shall be qualified in accordance with ASTM C1093.
- C. Mortar: Provide certified test results for mortar in accordance with ASTM C270. Test results shall not be more than 12 months old. The testing agency that provides the certified test results shall be qualified in accordance with ASTM C1093.
- D. Grout: Provide certified test results for grout in accordance with ASTM C1019 to verify conformance with ASTM C476. Test results shall not be more than 12 months old. The testing agency that provides the certified test results shall be qualified in accordance with ASTM C1093. Test results that reference ACI 318 or concrete compressive strength will be rejected.
- E. Aggregates: Aggregates used in mortar and grout shall be nonreactive. Submit certifications for aggregates in mortar in accordance with ASTM C144 and aggregates in grout in accordance with ASTM C404. The aggregates submitted shall be consistent with the products intended for use and strength test results.
- F. Efflorescence Testing: Provide certified efflorescence testing reports for concrete masonry units in accordance with ASTM C67, not less than 12 months old. The testing agency that provides the certified test results shall be qualified in accordance with ASTM C1093.
- G. Special Inspections and Testing: Special Inspections and testing shall be performed as referenced in the Contract Documents. Reference the Structural Drawing Sheet S1 for additional information. All masonry construction or work shall be subject to inspections by the local building official and the Owner's

representative. The Contractor shall make work or construction accessible and exposed for inspection of the cells and for the size and placement of reinforcement, anchors, or other embedded items.

1.05 COORDINATION

- A. Coordinate the layout with the masonry control joints and contraction joints as shown in the Contract Documents.
- B. Coordinate with other trades whose items that require attachments to masonry or embedment into masonry.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Acceptance at Site: Materials shall be delivered to the site in unbroken containers, plainly marked and labeled with manufacturers' names and brands, stored in dry, weathertight enclosures to prevent entry of foreign materials and damage by water or dampness. Masonry units shall be stored off the ground and handled with care to avoid chipping and breakage. Remove chipped, cracked, and otherwise defective units from site.
- B. Storage and Protection: Store material protected from moisture and from contamination by dirt, mud, or other foreign material. Concrete masonry units shall not be wetted.
 - 1. Sand shall be covered to prevent intrusion of water and foreign materials and to prevent drying.
- C. Environmental Requirements: Comply with requirements of TMS 602 and IMIAC.
 - 1. Materials containing frost or ice shall not be used.
 - 2. Cold Weather Requirements:
 - a. When ambient temperature is below 40°F. Maintain all materials at or above 40°F during mixing, placing, and for 48 hours after placement. Protect materials or heat materials, protect, enclose, or heat work areas. Maintain temperature of mortar and grout below 90°F.
 - 3. Hot Weather Requirements:
 - a. When ambient temperature exceeds 90°F. Maintain temperature of mortar and grout below 90°F. Fog spray new completed masonry work for 72 hours.

1.07 DEFINITIONS

- A. Cleanouts: Openings that are sized and spaced to allow removal of debris from the bottom of the grout space.
- B. Lift or Grout Lift: An increment of grout height within a total grout pour. A grout pour consists of one or more grout lifts.
- C. Pour or Grout Pour: The total height of masonry to be grouted prior to erection of additional masonry. A grout pour consists of one or more grout lifts.
- D. Exterior Units: Concrete masonry units placed with exterior exposed surfaces.
- E. Interior Units: Concrete masonry units placed with no exterior surfaces.
- F. Interior Face: Any surface of concrete masonry units that is on the inside of structures and not exposed to weather.
- G. Exterior Face: Any surface of concrete masonry units that is exposed to weather or buried.

- H. Self-Consolidating Grout: A highly fluid and stable grout that remains homogenous when placed and does not require puddling or vibration for consolidation.
- I. Running-Bond: The placement of masonry units so that head joints in successive courses are horizontally offset at least one-quarter the unit length.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Concrete masonry units shall be of modular dimensions and wet or steam cured. Concrete masonry units shall be hollow, load-bearing type, fully grouted and conforming to the following:
 - 1. Compliance: ASTM C90
 - 2. Unit Size: As noted on the Structural Drawings.
 - 3. Unit Type: Medium Weight, not exceeding 80 pounds per square-foot, fully grouted.
 - 4. Net Area Compressive Strength of Concrete Masonry at 28-Days: 2,000 psi
 - 5. Unit Style: As shown on the Architectural Drawings.
 - 6. Color: As shown on the Architectural Drawings. Submit samples for review and selection prior to ordering any materials.
- B. Second-hand concrete masonry units shall not be used unless they conform to the requirements of new units and are approved by the Engineer of Record. The units shall be of whole, sound material and free from cracks and other defects. Second-hand units with previously used mortar residue shall not be used.
- C. Shapes such as bond beams, corners, lintels, sills, headers, jambs, pilasters, cap masonry units, half-units, sash blocks, and other special shapes shall be provided as necessary to complete the work. Special shapes shall conform to the requirements of the concrete masonry units listed above.
- D. Waterproofing and Efflorescence Control:
 - 1. Concrete masonry units shall contain a clear integral water repellant admixture that shall not be detrimental to bonding or help the process of efflorescence. Waterproofing shall be in accordance with ASTM E-514, Grade E: Dry Block Admixture by W.R. Grace Co., MasterPel 240 by BASF, or approved equal.
 - 2. Reference Section 07 10 00 and Section 09 96 00 for additional information regarding exterior water repellant sealer.
- E. Cleaning Materials: Masonry cleaner shall be non-acidic and shall not alter the color of the concrete masonry units, Sure Klean 600 Detergent, by ProSoCo, Inc. or equal. Efflorescence Control System (ECS), by ProSoCo, Inc. or equal.
- F. Concrete Masonry Unit Manufacturers:
 - 1. Basalite Concrete Products LLC, Dixon, CA; Calstone Company, Inc, Galt, CA; Desert Block Company, Inc, Bakersfield, CA; or equal.
 - 2. Angelus Block Company, Inc., of Sun Valley, CA; Air Vol Block, Inc., of San Luis Obispo, CA; Orco Block Company, Inc., of Stanton, CA; or equal..

2.02 MORTAR

- A. Mortar for concrete masonry construction shall conform to ASTM C270, Type M or S. Type S shall be used for exterior walls, load bearing walls, and shear walls. Type M shall only be used for retaining walls or site walls.
 - 1. Strength: Net Area Compressive Strength of ASTM C90 Concrete Masonry Units considering Type M or S mortar shall not be less than 2,000 psi.
 - 2. Color: Tint mortar with mineral oxide colors to match selected block color unless otherwise shown on the Drawings.
 - 3. Cement: Portland cement conforming to ASTM C150, Type II, low alkali containing less than 0.60 percent alkali. Masonry cement is not permitted for use.
 - 4. Fly-ash: ASTM C618, Class F and shall not exceed 15 percent of the combined weight of cementitious materials. Class C fly-ash is not permitted.
 - 5. Hydrated Lime: Conform to ASTM C207, Type S.
 - 6. Aggregates: Sand shall be nonreactive and shall conform to ASTM C144. Do not allow more than 2% by weight of deleterious substance.
 - 7. Water: Water used in mortar shall be clear, clean, potable, and free from alkalis and substances that could adversely affect the mortar.
- B. Waterproofing: Mortar shall contain an integral water-repellant admixture that is not detrimental to the bonding or help the efflorescence process, BASF MasterPel 240MA Mortar Admixture, Euclid Blockite Mortar Admixture, or Dry Block Admixture by W.R. Grace Co. or equal.

2.03 GROUT

- A. Grout for concrete masonry construction shall conform to ASTM C476 and have a minimum compressive strength of 2,000 psi at 28-days.
 - 1. Cement: Portland cement conforming to ASTM C150, Type II, low alkali, containing less than 0.60 percent alkali.
 - 2. Fly-Ash: ASTM C618, Class F and shall not exceed 10 percent of the combined weight of cementitious materials nor more than 20% of the weight of the cementitious materials. Class C fly-ash is not permitted. The total weight of cementitious materials in the grout mix shall not exceed 610 pounds.
 - 3. Aggregates: Aggregates shall be nonreactive and shall conform to ASTM C404.
 - 4. Admixtures: Do not use admixtures in grout. Admixtures in grout will not be permitted.
 - 5. Slump: Grout shall have a slump between 8 and 10 inches during the time of placement.
 - 6. Water: Water used in grout shall be clear, clean, potable, and free from alkalis and substances that could adversely affect the mortar.
- B. Self-Consolidating Grout:
 - 1. Prior approval by the Engineer of Record is required for the use of self-consolidating grout. Self-consolidating grout shall meet the requirements of grout as mentioned above, except the following:
 - a. Manufacturers of self-consolidating grout shall have 5 years' experience with successful projects with self-consolidating grout.
 - b. Submittals that indicate the self-consolidating grout is a shotcrete or concrete mix, will not be acceptable.
 - c. Proportion in accordance with TMS 602 and ASTM C476.

- d. Compressive strength tests performed in accordance with ASTM C1019 and slump flow and determining the Visual Stability Index (VSI) less than or equal to 1.0 using ASTM C1611. Additional testing may be required at no additional cost to the Owner and shall be sent to the Engineer of Record for review.
- e. Slump: Self-consolidating grout shall have a slump flow of 24 to 30 inches as determined by ASTM C1611.
- f. Admixtures: High-range water-reducing admixtures (polycarboxylates) in accordance with ASTM C494, Type F or G.
- g. Field addition of admixtures or water is not permitted.

2.04 REINFORCEMENT

- A. Reinforcing steel bars in masonry construction shall be deformed bars conforming to ASTM A615, Grade 60.
- B. Reinforcing bars shall be fabricated in accordance with ACI 117 tolerances.

2.05 ACCESSORIES

- A. Control Joints (Contraction Joints): Masonry control joints shall be in accordance with ASTM D2287, Type PVC 654-4 PVC shear keys with a minimum durometer hardness of 85. Install sash blocks each side of joint as required to meet the selected control joint requirements.
- B. Expansion Joints: Expansion joints or pre-formed filler material in concrete masonry construction shall comply with ASTM D1056, Class 2A.
- C. Backer-Rods: Joint sealant shall be backed with round closed-cell polyethylene per ASTM D1549, installed per manufacturer's instructions.
- D. Joint Sealant: Joint sealant in concrete masonry expansion joints shall be in accordance with ASTM C920 and Section 07 92 00.
- E. Anchors and Ties
 - 1. Post-installed anchors shall be in accordance with Sections 01 87 13 and 05 09 00 and shall have a relative and current ICC-ESR or IAPMO-UES report. Anchorage to masonry shall demonstrate compliance for seismic applications. Anchorage to masonry shall be of the following:
 - a. Adhesive post-installed anchors in masonry shall be HILTI HIT-HY-70, Simpson Set-XP, or approved equal.
 - b. Mechanical post-installed anchors in masonry shall be Hilti Kwik Bolt 3 Masonry Anchors or approved equal.
- F. Rigid Steel Anchors:
 - 1. Rigid steel anchors shall be not less than 1 inch wide, 1/4-inch-thick, and 24 inches long with each end bent not less than 2 inches.

2.06 WATERP REPELLENT SEALER

- A. A water repellent sealer shall be applied to concrete masonry units and mortar joints in strict conformance with Section 07 10 00.
- B. See Section 9 96 23 for additional information regarding waterproofing masonry and masonry joints.

PART 3 - EXECUTION

3.01 PREPARATION

- A. General:
 - 1. Concrete masonry construction shall be in accordance with TMS 602 and the CBC.
 - 2. Foundations for masonry work shall be straight, on-line, and level. All surfaces to be bonded with masonry shall be clean and free from laitance or foreign materials.
 - 3. Reinforcing dowels shall be in the correct location as specified. The placement and location of anchor ties, inserts, and other embedded items in concrete or other adjoining work shall be coordinated by the Contractor.
 - 4. Temporary bracing shall be provided as required to prevent damage during construction.
- B. Surface Preparation:
 - 1. Coordinate the number, size, length, and location of reinforcing dowels between concrete work and masonry.
 - 2. Clean reinforcement of mill scale, loose rust, oil and coatings.
 - 3. Sandblast concrete foundation or slab to expose aggregate.
 - 4. Use bonding agent to bond the first layer of mortar setting bed to the concrete slab or foundation.
 - 5. Construct grout spaces free of mortar dropping, debris, loose aggregates, and any material deleterious to masonry grout.
- C. Drilling, cutting, fitting, and patching to accommodate the work of others shall be performed by masonry mechanics. Masonry shall be cut accurately and clean to size, with power driven masonry saws.
- D. Protection: Protect materials and completed work from cold and hot weather in accordance with building codes and the recommendations of the International Masonry Industry All Weather Council (IMIAC): Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

3.02 INSTALLATION OF REINFORCING

- A. Place reinforcement, wall ties, and anchors in accordance with the size, types, and locations as indicated on the Drawings. Do not place dissimilar metals in contact with each other.
- B. Support reinforcement to prevent displacement caused by construction loads or by placement of grout or mortar. Reinforcing steel shall be held in position, in a straight alignment and secure against displacement with metal positioners spaced not further apart than 112-bar diameters. Tie at intersections using 16-gauge annealed wire.
- C. Maintain clear distance between reinforcing bars and interior masonry unit or formed surface of at least 1/4-inch for fine grout and 1/2 -inch for coarse grout, except where cross webs of hollow units are used for supports for horizontal reinforcement.
- D. Place reinforcing bars maintaining the following minimum cover:
 - 1. Masonry face exposed to earth or weather: 2 inches for #5 bars and larger; 1-1/2-inches for #5 bars or smaller.
 - 2. Masonry not exposed to earth or weather: 1-1/2 inch.

- E. Maintain minimum clear distance between parallel bars of the nominal bar size or 1-inch, whichever is greater.
- F. In masonry columns and pilasters, maintain minimum clear distances between vertical bars of one and one-half times the nominal bar size or 1-1/2 inch, whichever is greater.
- G. Splice or lap reinforcing steel only where indicated on the Drawings.
 - 1. Noncontact Lap Splices: Position bars spliced by noncontact lap splices no further apart transversely than one-fifth the specified length of lap nor more than 6 inches. The use of noncontact lap splices will require pre-approval by the Engineer of Record.
- H. Field bending of reinforcement is not permitted. Do not bend reinforcement after it is embedded in concrete, grout, or mortar.
- I. Should the location of the vertical dowel conflict with other work including placement of embedded items, walls of the masonry units or openings in walls,
- J. Cleanouts
 - 1. Provide cleanout openings in the bottom course of masonry for each pour when the grout pour height exceeds 5 feet 4-inches. Provide cleanouts in the bottom course of cells containing vertical reinforcing.
 - 2. Construct cleanouts so that the space to be grouted can be cleaned and inspected. Spacing of cleanout openings shall not exceed 32 inches.
 - 3. Locate cleanouts on the inside face of the exterior walls; seal cleanouts with closures braced to resist grout pressure, after inspection and before grouting.
 - 4. Remove mortar fins and any foreign matter from the grout space.
 - 5. Cleanouts may be eliminated if grout pour height is reduced to a maximum of 2 feet.
 - 6. Seal cleanout holes with masonry units after inspection and before grouting. Use a high-pressure jet stream of water to remove mortar fins and any foreign matter from the grout space.

3.03 MASONRY CONSTRUCTION

- A. General:
 - 1. Lay masonry unit in running bond.
 - 2. Lay masonry units so the vertical cells line up and are not obstructed by excess mortar.
 - 3. Unless noted otherwise on the Drawings, provide additional vertical reinforcing bar at every corner and each side of every wall opening.
 - 4. Unless noted otherwise on the Drawings, construct horizontal bond beams reinforced with one bar at the top and bottom of walls and at intermediate locations where shown, but not farther apart than 2-feet.
 - 5. Construct bond beams over openings reinforced as shown.
 - 6. Fully bed webs and cross walls forming such cells in mortar to prevent leakage of grout.
 - 7. Grout all cells unless otherwise noted on drawings.
 - 8. When the ambient air temperature is below 40 degrees F, cold weather procedures shall be implemented in accordance with TMS 602 and submitted to the Engineer of Record for review.
 - 9. When the ambient air temperature is below 90 degrees F, hot weather procedures shall be implemented in accordance with TMS 602 and submitted to the Engineer of Record for review.

- B. Mixing Mortar
1. Mix mortar ingredients in accordance with ASTM C270. Proportion mortar by volume using containers of known volume.
 2. Mix cementitious materials and aggregates between 3 and 5 minutes in a mechanical batch mixer with sufficient amount of water to produce a workable consistency. Do not hand mix mortar.
 3. Add only enough water to produce a plastic mix. Do not re-temper mortar that has begun to hydrate.
 4. Any mortar that is unused within 2 hours after initial mixing shall be removed from the work.
- C. Joints:
1. In the starting course on foundations, construct bed joints so the bed joint thickness is at least 1/4-inch and not more than 1-1/4-inch. Bed joints shall be of uniform thickness.
 2. Set units with 3/8-inch-thick mortar joints. Compress partially set mortar with a convex tool to produce a concave, dense, and smooth joint surface.
 3. Set units with joints straight and uniform in width in accordance with TMS 602. Place clean units while the mortar is soft and plastic. Remove and re-lay in fresh mortar any unit disturbed to the extent that the initial bond is broken after initial positioning.
 4. Butter head joints solid for the thickness of the face shell so that there are no voids between abutting faces. Set units in bed joints that are filled solid with mortar for the thickness of the face shell.
 5. Remove mortar fins that project more than 3/8-inch into the grout cell.
 6. Set lintels, capping units, and bearing plates in a full bed of mortar.
 7. Locate control joints as shown on the Drawings or at 20 feet maximum spacing where not shown, but not less than 4 feet from a jam or opening.
 8. Place bond beam reinforcing continuous through expansion and control joints, wrapping bars with 1/8-inch thick bond breaking tape 2 feet both sides of joint. Do not splice bond beam reinforcing within 6 feet of an expansion or control joint.

3.04 GROUTING:

1. Mix grout in accordance with the requirements of ASTM C476.
2. Place grout within 90 minutes of introducing water in the mixture and prior to initial set. Discontinue placement of grout within 90-minutes after the addition of water. Any grout that arrives on site intended for placement after 90-minutes of initial mixing shall be removed from the site without placement.
3. Discard site-mixed grout that does not meet the specified slump without adding water after initial mixing only.
4. Limit maximum height of grout pour to 5 feet 4-inch unless otherwise favorably reviewed by the Engineer of Record.
5. Place grout in the reinforced hollow concrete masonry unit wall after the units have been set for at least 24 hours.
6. Place grout using a method to avoid segregation.
7. Fill all cells solid with grout unless otherwise noted on Drawings. Consolidate grout by mechanical vibration unless self-consolidating grout is specifically approved by the Engineer of Record.
8. Consolidation of the succeeding grout lift and the reconsolidation of the previous grout lift may be done in the same operation. Reconsolidate each lift after initial water loss and settlement has occurred.

9. If grouting is done in multiple lifts stop the top surface of the grout of each lift 1-1/2 inches below a mortar joint, except at the top of a wall. When grouting bond beams stop the grout pour 1/2-inch below the top of the masonry unit.
 10. Form grout key between pours by terminating the grout a minimum of 1-1/2 inch below the mortar joint. Do not form grout keys within beams. At beams or lintels laid close to bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.
 11. Self-consolidating grout shall be in accordance with TMS 602.
- B. Interface with Other Work
1. Embedded items shall be secured in place to prevent displacement during grouting.
 2. Build in or embed other work required to be built into masonry only where shown on Drawings.
 3. At openings for ducts, pipes, and conduit, cut to half or full unit dimensions.
 4. Pipes, conduits, and sleeves passing vertically or horizontally through masonry shall not be placed closer than three diameters on center, nor shall they impair the strength of the masonry. Pipes, conduits, and sleeves passing vertically shall not be placed in the same cell as vertical reinforcement. Pipes, conduits, and sleeves passing horizontally shall not be placed in bond beams.
- C. Site Tolerances:
1. Foundation Tolerances: level alignment of +/- 1/2-inch.
 2. Dimensional Tolerances:
 - a. Cross Section: -1/4-inch.
 - b. Elevation: + 1/2-inch.
 - c. Mortar Joint Thickness Between Courses: +/- 1/8-inch.
 3. Reinforcement Tolerances: Unless noted otherwise reinforcement shall be placed at center cell within +/- 1/2-inch tolerance measured in the direction perpendicular to the wall plane. Vertical wall reinforcement within +/- 1-inch measured in the plane of the wall when the wall segment does not exceed 24 inches.
 4. Site Tolerances: Lay masonry plumb, true to line with courses level. Keep bond pattern plumb throughout. Lay masonry within 1/4-inch tolerance in 10 feet maximum variation in plumb in the lines and surfaces of columns and walls and in the flutes and surfaces of fluted or split face masonry units.
 5. Other masonry unit and reinforcing tolerances shall be within the tolerances specified in TMS 602. Notify the Engineer of Record if the tolerances are not met.

3.05 PROTECTION

- A. Cure mortar joints by keeping masonry units and joints damp for 10-days after laying units by applying a very fine water mist spray and covering work with polyethylene sheeting.
- B. When the possibility of rain occurs prior installation of roofing or cap blocks at the top of walls, cover the tops and face of walls exposed to the weather, and concrete masonry units with sheets of polyethylene film.

3.06 WATER REPELLENT SEALER

- A. Apply water repellent sealer as specified in Section 07 10 00.

- B. Do not deviate from the application of water repellent sealer and comply with the manufacturer's instructions.

3.07 FIELD QUALITY CONTROL

- A. Verify that ready-mix batch plant delivery tickets contain product information necessary for acceptance of the grout delivered to site.
- B. Verify that the mixing and trucking equipment have adequate capacity to deliver the grout batches to site on time, thoroughly mixed and discharge without segregation.
- C. Site Tests: Level 3 Quality Assurance tests shall be performed in accordance with the Contract Documents and TMS 602. Reference the Drawings for a list of tests required.
 - 1. Test three units for each 5,000 square-feet of wall area, but not less than one set of three units per project. Test results shall comply with the CBC and TMS 602. Test grout by the prism test method in accordance with ASTM C1314.
 - 2. Test mortar for compressive strength in accordance with ASTM C780. Make one mortar sample, consisting of three cylinders, at the beginning of the masonry work on three successive days and at one week interval thereafter.
 - 3. Submit test reports to the Engineer of Record.
- D. Special Inspections:
 - 1. Special Inspections and testing shall be performed as referenced in the Contract Documents. Reference the Structural Drawing Sheet S001 through S003 for additional information. All masonry construction or work shall be subject to inspections by the local building official and the Owner's representative. The Contractor shall make work or construction accessible and exposed for inspection of the cells and for the size and placement of reinforcement, anchors, or other embedded items.
 - 2. Submit a final signed report stating that whether the Work required Special Inspections was, to the best of the Inspection Agency's knowledge, in conformance.
 - 3. Submit final report to the Engineer of Record and Contractor.
- E. Locate and avoid all reinforcement prior to drilling into masonry for attachment or post-installed anchors.

3.08 REPAIR / RESTORATION

- A. Remove from exposed surfaces surplus mortar, grout, foreign material, and stains.
- B. Replace unevenly laid units.
- C. Replace chipped or broken masonry units.
- D. Point holes or defective mortar joints in exposed masonry and cut-out and re-point defective joints. Repoint cracks in mortar joints with a pointing mortar.
- E. Repair cracks wider than 4 mils. Submit repair procedure and products to Engineer of Record for review prior to repair work is performed. All masonry repair procedure and products shall comply with TMS 402/602.

3.09 CLEANING

- A. Clean masonry surfaces of stains, efflorescence, mortar, and grout droppings by scrubbing with water, masonry cleaner and bristle brushes. Do not clean with muriatic acid. Do not use high pressure cleaning equipment.

END OF SECTION

SECTION 05 09 00

ANCHORS IN CONCRETE AND MASONRY

PART 1 - GENERAL

1.01 SUMMARY

- A. This section is applicable for anchors, anchor category, anchor groups, anchor systems in concrete and masonry construction. This includes, but is not limited to:
 - 1. Cast-in-place anchors bolts, welded headed anchors, and anchor studs.
 - 2. Post-installed adhesive anchors.
 - 3. Post-installed adhesive steel reinforcing bars (rebar).
 - 4. Post-installed mechanical anchors.
 - 5. Anchors intended to be used as part of a deferred submittal.
- B. All post-installed anchors and adhesive for reinforcement shall be rated for use and installation in cracked concrete and cracked masonry. Post-installed anchors and adhesives for reinforcement rated only for uncracked concrete and uncracked masonry will not be permitted for use.

1.02 REFERENCES

- A. American Concrete Institute (ACI):
 - 1. ACI 318 Building Code Requirements for Structural Concrete and Commentary
 - 2. ACI 350 Code Requirements for Environmental Engineering Concrete Structures and Commentary
 - 3. ACI 355.2 Qualification of Post-Installed Mechanical Anchors in Concrete and Commentary
 - 4. ACI 355.4 Qualification of Post-Installed Adhesive Anchors in Concrete and Commentary
- B. American National Standards Institute (ANSI):
 - 1. ANSI/ASME B1.1 Unified Inch Screw Threads (UN, UNR, and UNJ Thread Forms)
 - 2. ANSI/ASME B18.2.2 Square and Hex Nuts
 - 3. ANSI/ASME B18.22.1 Plain Washers
 - 4. ANSI/AMSE B212.15 Cutting Tools – Carbide-Tipped Masonry Drills and Blanks for Carbide-Tipped Masonry Drills
- C. American Society for Testing and Materials (ASTM), Standard Specification for:
 - 1. ASTM A29 General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought
 - 2. ASTM A108 Steel Bar, Carbon and Alloy, Cold-Finished
 - 3. ASTM A153 Zinc Coating (Hot-Dip) on Iron and Steel Hardware
 - 4. ASTM A193 Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature or High-Pressure Service and Other Special Purpose Applications
 - 5. ASTM A563 Carbon and Alloy Steel Nuts (Inch and Metric)
 - 6. ASTM A615 Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
 - 7. ASTM A706 Deformed and Plain Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement

8. ASTM A1044 Steed Stud Assemblies for Shear Reinforcement of Concrete
 9. ASTM B633 Electrodeposited Coatings of Zinc on Iron and Steel
 10. ASTM B695 Coatings of Zinc Mechanically Deposited on Iron and Steel
 11. ASTM C881 Epoxy-Resin-Base Bonding Systems for Concrete
 12. ASTM F436 Hardened Steel Washers Inch and Metric Dimensions
 13. ASTM F593 Stainless Steel Bolts, Hex Cap Screws, and Studs
 14. ASTM F594 Stainless Steel Nuts
 15. ASTM F844 Washers, Steel, Plain (Flat), Unhardened for General Use
 16. ASTM F1554 Anchors Bolts, Steel, 36, 55, and 105-ksi Yield Strength
 17. ASTM F1941 Electrodeposited Coatings on Mechanical Fasteners, Inch and Metric
 18. ASTM F2329 Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners
- D. Federal Specifications A-A-1922A Type 2 only, A-A01923A Type 4 only and A-A-55614 for Expansion and Shield-Type Anchors
- E. International Code Council (ICC) Evaluation Service, Acceptance Criteria (AC) for:
1. AC 01 Mechanical Anchors in Cracked and Uncracked Masonry Elements
 2. AC 58 Adhesive Anchors in Cracked and Uncracked Masonry Elements
 3. AC 106 Predrilled Fasteners (Screw Anchors) in Masonry
 4. AC 193 Acceptance Criteria for Mechanical Anchors in Concrete Elements
 5. AC 308 Post-Installed Adhesive Anchors in Concrete Elements
 6. AC 510 Seismic Qualification of Post-Installed Anchors in Concrete
- F. International Standards Organization (ISO):
1. ISO/IEC 17011 Conformity Assessment – General Requirements for Accreditation Bodies.
 2. ISO/IEC 17025 General Requirements for the Competence of Calibration and Testing Laboratories.
 3. ISO/ASQ/ASNI 9000 Quality Management Systems – Fundamentals and Vocabulary
- G. TMS 402/602 Building Code Requirements and Specifications for Masonry Structures, The Masonry Society (TMS)

1.03 SUBMITTALS

- A. Product Data:
1. Anchor bolts, anchor studs, anchorage devices, and threaded rods, shall include at minimum the following:
 - a. Diameter(s)
 - b. Material grade designation, hardness, coatings, minimum yield and minimum tensile strength consistent with the Contract Documents and/or favorably reviewed deferred submittals.
 - c. Overall length, including extension length.
 - d. Embedment length consistent with the Contract Documents and/or favorably reviewed deferred submittals.
 - e. Stand-offs and/or leveling nuts type, dimensional properties, material properties, grade, and location.
 2. Submit material grade, thickness, and dimensional data for nuts and washers.
 3. Adhesives.

4. Mechanical anchors, expansion anchors.
 5. Other fasteners embedded in concrete and masonry as indicated within the Contract Documents and/or favorably reviewed submittal.
- B. Accepted Criteria:
1. ICC Evaluation Service Reports (ICC-ESR), or equivalent IAPMO-UES evaluation reports, for all anchor products submitted, demonstrating compliance with CBC applicable ACI acceptance criteria.
 2. A submittal without a relative and current evaluation report will not be accepted.
- C. Anchor Installation Plan:
1. List of all anchors installed including location, diameter, material type, number, and length of anchors.
 2. For post-installed anchors include a description of the drilling equipment, hole cleaning and preparation procedure, adhesive injection or mechanical anchor insertion technique, preparation for rebar dowels and threaded rods, and torquing procedure.
 3. Testing plan for anchors, including percentage of anchors to be tested and proof loads for anchors (see Verification Testing below).
 4. Certified Verification Testing Report:
 - a. Detailing results of field testing required in Tests and Additional Tests below.
 - b. Certified by an independent testing laboratory or registered Professional Civil or Structural Engineer licensed to practice in the State where the project is being constructed.
- D. Anchorage in Concrete and Masonry as a Deferred Submittal:
1. Complete calculations, details, and complete reference drawings that are required to be submitted as part of a deferred submittal and as defined in the CBC and within the Contract Documents, shall be prepared, stamped, signed, and furnished by a Professional Civil or Structural Engineer licensed to practice in the State where the project is being constructed.
 2. Comply with Specification Section 01 87 13.
 3. Deferred submittal calculations and details shall be prepared and designed in accordance with the applicable codes referenced within the Contract Documents. Anchors shall be assumed to see a maximum short-term service temperature of 130°F and a long-term service temperature of 110°F, unless otherwise specified.
 4. Minimum Calculation and Reference Drawing Requirements:
 - a. Calculations shall be comprehensible and complete. When evaluating the structural strengths, indicate stress for comparing with strengths or show the demand versus capacity ratio in the structural elements. Evaluating the results by stating "Okay by Inspection" is not acceptable.
 - b. Derivation of forces used, including at least one complete sample calculation, showing the process used so that Engineer of Record may determine general conformance. Printouts of spreadsheets without explanation of calculations used to determine values are not acceptable.
 - c. Submittal calculations and details shall demonstrate a complete vertical and lateral load path and shall clearly indicate all forces imposed on the supporting structure. Include all load combinations used in the design shall be referenced and include a clear indication whether service level or strength level was used in the design.
 - d. Reference drawings shall include plans, sections, details, and equipment information as necessary for calculations. Indicate the location of the equipment on plan which is necessary for the development of load calculations.

- e. The Engineer of Record's review of the deferred submittal items identified in Contract Documents cannot be completed until all related items have been coordinated and submitted for review. Submittals will be returned without review if:
 - 1) The calculations and details are not sealed and signed by a Professional Civil or Structural Engineer licensed to practice in the State where the project is being constructed.
 - 2) Submittals include only calculations without reference drawings.
 - 3) Calculations have no sheet numbers or sheets are missing.
 - 4) Calculations or reference drawings are illegible.
 - 5) Calculations are made based on wrong information, assumptions, or design parameters.
 - 6) Information in reference drawings is insufficient for calculations or review.
 - 7) No details of the anchorage are provided.
- 5. Anchorage Details as a Deferred Submittal:
 - a. Anchorage details shall be prepared, stamped, signed, and furnished by a Professional Civil or Structural Engineer licensed to practice in the State where the project is being constructed.
 - b. Anchorage details shall include the required concrete strength and masonry strength consistent with the Contract Documents, anchor bolt diameter, embed, spacing, maximum grout pad height, and edge distances consistent with the favorably reviewed submittal calculations.
 - c. Include anchoring methods and leveling criteria for equipment consistent with manufacturer's recommendations.
- 6. Coordination and Other Shop Drawings:
 - a. The Contractor is responsible for coordinating the final foundation sizes with the final size of equipment and final anchorage calculations, including the coordination for any required edge distance as noted in the favorably reviewed anchorage submittal.
 - b. Deferred submittals that require anchor reinforcement or supplementary reinforcement identified in a favorably reviewed submittal or the Contract Documents shall be included in that specific shop drawing submittal.
 - c. Deferred submittals that require edge distance that exceeds the available edge distance noted on the Contract Drawings, shall notify the Engineer of Record prior to ordering or fabricating any materials.
- E. Quality Assurance Submittals
 - 1. The Contractor shall be qualified to install cast-in-place and post-installed anchors.
 - 2. Certification of Installation:
 - a. For Post-Installed Anchors: Submit a certification of completion of each individual installing the anchors consistent with the Contract Documents or favorably reviewed deferred submittal.
 - 3. Evaluation Reports:
 - a. Submit the current and relative ICC-ESR or IAPMO-UES reports used in the design of anchorage. A submittal without a relative and current ICC-ESR or IAPMO-UES report will be rejected.
 - 4. Verification of Installation:
 - a. Special Inspection reports or documentation verifying the anchor installation was performed in accordance with the Contract Documents and OR or favorably reviewed deferred submittal.

- b. Anchorage as a Deferred Submittal: Submit a letter from the Contractor's Engineer indicating the installation was performed as required by the favorably reviewed deferred submittal and ICC-ESR or IAPMO-UES report.
- 5. Test Reports:
 - a. Submit test reports for testing of anchors in accordance with the Contract Documents.

1.04 QUALITY ASSURANCE

A. General:

- 1. Contractor Qualifications: 5-years of experience installing similar anchors in concrete and masonry structures.
- 2. Anchors shall be manufactured under a certified quality system meeting the requirements of the ISO 9000 quality management system or equivalent.
- 3. All anchors shall be tested and evaluated under an approved quality assurance program with following-up by an inspection agency under ISO/IEC 17020 by a recognized accreditation body conforming to the requirements of ISO/IEC 17011.
- 4. Anchors shall be stamped with identifying marks and colors.
- 5. Installer Training:
 - a. Complete a thorough training with the manufacturer or the manufacturer's representative for the submitted product. Training shall consist of a review of the complete installation process for drilled-in anchors, including but not limited to:
 - 1) Hole drilling procedure(s),
 - 2) Hole preparation and cleaning technique(s),
 - 3) Adhesive injection technique(s), dispenser training and maintenance,
 - 4) Reinforcing steel dowel preparation and installation procedures,
 - 5) Proof loading and torquing.
 - b. Individuals that have not completed the quality assurance requirements of this Section will not be permitted to install anchors without qualifications specific to the products intended for use.

B. Special Inspection and Testing:

- 1. General:
 - a. The Owner or Owner's authorized agent, independent of the Contractor, shall employ one or more approved agencies to provide special inspections and testing in accordance with the Contract Documents, Chapter 17 of the CBC and the current and relative ICC-ESR or IAPMO-UES.
 - b. Special Inspections and Testing shall be independent of the Contractor.
 - c. Special Inspections and Testing shall govern the quality, workmanship, and requirements for materials covered with in the Contract Documents.
 - d. Materials of construction and testing shall conform to the applicable standards listed in the referenced building code and Contract Documents.
- 2. Special Inspections:
 - a. Special Inspections shall comply with the Contract Documents and schedules identified on the Drawings. Unless otherwise specified within the Contract Documents, at a minimum the special inspection of anchors in concrete and masonry shall comply with Chapter 17 of the CBC and ICC-ESR or IAPMO-UES evaluation reports.
 - b. At a minimum, the Special Inspector shall visually inspect the following, but not limited to: required substrate type and thickness, presence of moisture on the substrate, anchor bolt layout, hole cleaning procedures, product identification and expiration date, product installation procedures, anchor bolt

- location, embedment, anchor size, anchor spacing, minimum edge distance, and installation temperature.
- c. Unless specifically identified elsewhere within the Contract Documents, all special inspections of anchors in concrete and masonry shall be periodic.
- 3. Verification Testing:
 - a. Cast-in-place anchors are not required to be tested after installation.
 - b. Anchors to be tested shall be selected at random by the Special Inspector or as requested by the Engineer of Record.
 - c. Testing is not required for post-installed anchors attached to interior partition walls or non-participating structural wall elements.
 - d. Adhesive Anchors: Proof Loading (Pull Test)
 - 1) Test Type: Unconfined
 - 2) Load Level: Proof load levels shall not exceed the lesser of 50-percent of the expected peak load based on adhesive bond strength or 80-percent of the anchor yield strength.
 - 3) Frequency: 10% of all post-installed expansion anchors or a minimum of 2, whichever is greater.
 - 4) Duration: Maintain proof load at the required load level for a minimum of 10 seconds.
 - e. Expansion Anchors: Torque Testing
 - 1) General:
 - a) If the application of torque for an anchor is specified by the manufacturer, torque shall follow the manufacturer requirements. If no torque for the anchor is specified by the manufacturer, the anchor shall be finger-tight before testing and tested as outlined below.
 - b) If the specified torque is not achieved within the required number of turns, the anchor shall be removed or abandoned.
 - 2) Test Type: Calibrated Torque Test, having a measured error within ± 5 -percent of the specified torque.
 - 3) Load Level: 50-percent of the installation torque.
 - 4) Frequency: 10% of all post-installed expansion anchors or a minimum of 2, whichever is greater.
 - 5) Duration: 10-minute wait time after install torquing with calibrated torque wrench.
 - f. Displacement-Controlled Expansion Anchors:
 - 1) Test Type: Prior to installation, verify by placing the setting tool into the anchor body to verify the full set prior to installation of the bolt or threaded rod. Verify recommended testing requirements with the manufacturer.
 - 2) Frequency: 10% of all post-installed expansion anchors or a minimum of 2, whichever is greater.
 - 3) Duration: In accordance with the manufacturer's requirements.
 - 4) Set displacement-controlled expansion-type anchors to the recommended displacement. If the concrete cracks during installation of the anchor, the anchor shall be removed or abandoned.
 - g. Undercut anchors that allow visual confirmation of full installation shall not require testing.
- C. Additional Tests:
 - 1. Anchors, washers, and nuts that require repair or are required to be replaced due to faulty work performed during installation shall be clearly identified, replaced, and re-tested at no additional cost to the Owner.

2. All materials and all additional documentation to substantiate any faulty or damaged anchors, washers, and nuts in an effort to avoid replacement shall be at no additional cost to the Owner.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Handle, ship, and store material in a manner that will prevent distortion, rust, damage to the shop coat or any other damage.
- B. Store material in a clean, properly drained location out of contact with the ground, and in accordance with the manufacturer's recommendations.
- C. Ensure that dissimilar metals are not in contact with each other.
- D. Replace or repair all damaged material to an equal product. Do not install damaged anchor bolts.
- E. Anchors and reinforcing steel bars shall be straight (no bends) and free of indentations or other defects along their length and threads.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS

- A. General
 1. Provide only named adhesive anchor products, mechanical anchors products, and anchor material types where specified within this Section or the Contract Documents.
 2. Product and anchor type deviations will only be considered provided the deferred submittal anchorage design calculations for the proposed products include supporting documentation consistent with this Section and the Contract Documents.
 - a. Provide a clear explanation to substantiate any proposed deviations.
 - b. The Engineer of Record will decide whether to accept or reject any proposed deviations.
 - c. Proposed deviations without a relative and current ICC-ES, or IAPMO UES evaluation report will not be accepted.

2.02 EXPOSURE AND FINISH

- A. The following table summarizes the minimum criteria for anchor material and hardware finishes for the specified exposure condition, unless otherwise specified in the Contract Documents:

Exposure Condition	Finish Type
Interior/ Exterior: Dry conditions. Interior and exterior locations not subjected to high moisture environments.	Hot-Dip Galvanized per ASTM F2329 or ASTM A153 or ASTM A193, Grade B7, or equal
High Moisture: Exposed to extreme weather conditions or high moisture environments not subjected to submerged conditions or placement in earth.	AISI 304, Type 304 Stainless-Steel or ASTM A193, Grade B8 Class 2, or equal

Submerged and//or Buried: All submerged and buried conditions, conditions where fasteners will be continuously or intermittently wet, exposed to corrosive chemicals, exposed to earth, or as required by other Specification Sections.	AISI 316, Type 316 Stainless-Steel or ASTM A193, Grade B8M Class 2, or equal
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- B. Do not install hot-dip galvanized or zinc coated anchors in high moisture, submerged, and buried conditions.

2.03 NUTS AND WASHERS

- A. Nuts and washer shall be used for the installation of all anchors, anchor bolts and anchor rods, for both cast-in-place and post-installed conditions. Comply with the following:
1. Size nuts and washers to accommodate galvanizing and plate threads where required.
 2. Do not oversize nuts or washers.
 3. Nuts shall be hex or heavy hex and shall meet the dimensional requirements of ASME B18.2.2, unless otherwise specified. Where a manufacturer specifies a type and finish of nut for a specific anchor, the manufacturer recommended nut shall be used.
 4. Washers shall be circular (round) and meet the dimensional requirements of ASME B18.21.1, unless otherwise specified. Where a manufacturer specifies a type and finish of washer for a specific anchor, the manufacturer recommended washer shall be used.
- B. The following hardware schedule summarizes the minimum criteria for nuts and washers to be used with the specified anchor material. Unless otherwise specified in the Contract Documents or a favorably reviewed submittal, the following shall apply to all anchor types:

Hardware Schedule for Nuts and Washers

Anchor Material	Nuts	Washers
ASTM F1554, Hot-Dip Galvanized, or Zinc Coated	ASTM A563, Grade A Hex or Heavy Hex Head	ASTM F844 or ASTM F436
ASTM A913, Grade B7 Alloy Steel	ASTM A194, Grade 2H Heavy Hex	ASTM F436, Type 1
ASTM 55 or 105, Hot-Dip Galvanized	ASTM A563, Grade DH Heavy Hex Head (or ASTM A194, Grade 2H)	ASTM F436, Type 3 (Round SAE Pattern)
Type 304 Stainless-Steel	ASTM F594, Alloy Group 1 CW1 (F594C) & CW2 (F594D)	AISI 304 (Type 304 Stainless-Steel)
ASTM A193, Grade B8 Class 2	ASTM A194, Grade 8 (Stainless AISI 304 Heavy Hex)	AISI 304 (Type 304 Stainless-Steel)
Type 316 Stainless-Steel	ASTM F594, Alloy Group 2 CW1 (F594G) & CW2 (F594H)	AISI 316 (Type 316 Stainless-Steel)
ASTM A193, Grade B8M Class 2	ASTM A194, Grade 8M (Stainless AISI 316 Heavy Hex)	AISI 316 (Type 316 Stainless-Steel)

- C. Leveling nuts used below base plates shall conform to the dimensions and materials used for nuts.

2.04 ANCHORS AND STEEL REINFORING BAR MATERIALS

A. Headed Anchor Bolts (Cast-in-Place):

1. All headed anchor bolts shall be cast-in-place, and conform to the following, unless specified elsewhere in the Contract Documents or favorably reviewed submittal:

Headed Anchor Bolts (Cast-in-Place)			
Anchor Type	Material Grade	Minimum Yield Strength	Minimum Tensile Strength
Standard: (Low-Carbon)	ASTM F1554, Grade 36	36 ksi	58 ksi
High-Strength: Low Alloy Alloy, Heat Treated	ASTM F1554, Grade 55 Grade 105	55 ksi 105 ksi	75 ksi 125 ksi
Stainless-Steel Type 304: Alloy Group 1 CW1 Alloy Group 1 CW2	ASTM F593C ASTM F593D	65 ksi 45 ksi	100 ksi 85 ksi
Stainless-Steel Type 316: Alloy Group 2 CW1 Alloy Group 2 CW2	ASTM F593G ASTM F593H	65 ksi 45 ksi	100 ksi 85 ksi

B. Welded Headed Studs (Cast-in-Place):

1. Welded headed studs shall be cast-in-place, welded directly to plates and secured in place. Welded headed studs shall conform to the following, unless specified elsewhere in the Contract Documents:

Welded Headed Studs (Cast-in-Place)			
Material	Grade or Type	Minimum Yield Strength	Minimum Tensile Strength
ASTM A29	Type B, 1010, 1020	65 ksi	51 ksi
ASTM A1044	Type 1	65 ksi	51 ksi
Stainless Steel Type 304 or Type 316	ASTM A276 or ASTM A493	35 ksi	70 ksi

2. Elongation: 20-percent in 2-inches minimum.
3. Reduction of area: 50-percent minimum.
4. Mechanical requirements for carbon steel welded headed studs shall comply with AWS D1.1.
5. Welded headed studs shall be attached with a stud welding gun. Fillet welding of welded headed studs will not be acceptable. Do not fillet weld headed studs.
6. Mechanical requirements for stainless-steel welded headed studs shall comply with AWS D1.6.
7. Avoid dissimilar metals. Plate material welded to the welded headed studs shall be compatible with the studs.

8. Hot-dip galvanize carbon steel welded head studs after welding. Do not galvanize prior to welding.
 9. Products: Headed Anchors by Nelson Stud Welding, Inc., Tru-Weld Steel Headed Stud Anchors by TFP Corporation, or equal.
- C. Threaded Anchor Rods (Cast-in-Place and Post-Installed):
1. Intended for cast-in-place and post-installed adhesive anchors, threaded anchor rods shall be straight, fully threaded, and comply with ANSI B1.1 UNC coarse thread series.
 2. For cast-in-place threaded anchor rods, provide double nuts with a washer between nuts at the embedded end of the threaded rod. Nuts and washer material shall comply with the hardware schedule for nuts and washers.
 3. Threaded anchor rods shall conform to the following, unless specified elsewhere within the Contract Documents or favorably reviewed submittal:

Threaded Anchor Rods (Fully Threaded)

Anchor Type	Material Grade	Minimum Yield Strength	Minimum Tensile Strength
Standard (Low-Carbon)	ASTM F1554, Grade 36	36 ksi	58 ksi
ASTM A913, Grade B7 Alloy Steel	ASTM A193, B7 (AISI 4140/ 4142)	105 ksi	125 ksi
High-Strength Low Alloy Alloy, Heat Treated	ASTM F1554, Grade 55 Grade 105	55 ksi 105 ksi	75 ksi 125 ksi
Stainless-Steel Type 304: Alloy Group 1 CW1 Alloy Group 1 CW2	ASTM F593C	65 ksi	100 ksi
	ASTM F593D	45 ksi	85 ksi
A193, Grade B8 (Stainless-Steel AISI 304)	ASTM A193, Grade B8 Class 2	60 ksi	100 ksi
Stainless-Steel Type 316: Alloy Group 2 CW1 Alloy Group 2 CW2	ASTM F593G	65 ksi	100 ksi
	ASTM F593H	45 ksi	85 ksi
A193, Grade B8M (Stainless-Steel AISI 316)	ASTM A193, Grade B8M Class 2	50 ksi	90 ksi

- D. Reinforcing Steel Bars (Post-Installed):
1. Reinforcing steel bars used for anchoring or post-installed conditions shall be used with an adhesive anchoring system approved for use in cracked concrete and cracked masonry.
 2. Reinforcing steel shall be deformed bars conforming to the following:

Steel Reinforcing Bars (for use with Adhesives)

Anchor Type	Material Grade	Minimum Yield Strength	Minimum Tensile Strength
ASTM A615 (Plain-Carbon Steel)	ASTM A615 Grade 60	60 ksi	90 ksi

Steel Reinforcing Bars (for use with Adhesives)

Anchor Type	Material Grade	Minimum Yield Strength	Minimum Tensile Strength
ASTM A706 (Low-Alloy Steel)	ASTM A706 Grade 60	60 ksi	80 ksi

3. The embedded portion of reinforcing steel bars shall be straight, and free of mill scale, rust, mud, oil, and other coatings that may impair the bond with the adhesive.
4. Provide 45-degree chisel or cut point on embedded end.
5. Do not bend reinforcing steel bars before or after installation.
6. Heating of reinforcing steel bars is not permitted.
7. Do not use ASTM A615, Grade 40 reinforcing steel bars unless approved by the Engineer of Record.

2.05 POST-INSTALLED ADHESIVE ANCHORS

A. Post-Installed Adhesive Anchoring Systems in Concrete:

1. General:
 - a. Adhesive anchoring systems for concrete shall be qualified per ACI 318 and ACI 355.4.
 - b. Adhesive anchoring systems shall have a relative and current evaluation report by ICC-ES and/or IAPMO-UES. Evaluation reports for adhesive anchoring systems shall be qualified for cracked concrete in Seismic Design Categories A through F. Do not use adhesive anchoring systems specified for masonry only in concrete.
 - c. Adhesive anchors shall be installed in concrete having a minimum age of 21-days, has not been exposed to water for the preceding 14-days, and has a minimum compressive strength of 3,000 psi at the time of anchor installation. Do not drill into concrete prior to 21-days.
2. Epoxy Adhesives in Concrete:
 - a. A two-component, epoxy-based, injectable, cartridge-type system meeting the requirements of ASTM C881 Type IV, Grade 3, Class B and C.
 - b. The adhesive shall be supplied in manufacturer's standard side-by-side cartridge and dispensed through a static-mixing nozzle supplied by the manufacturer.
 - c. Products:

Epoxy Adhesive Products in Concrete

Supplier	Products	Compliance
Adhesives Technology Corporation (ATC)	Ultrabond HS-1CC	ACI 318, ACI 355.4, ICC-ESR, IAPMO-UES
DeWalt	Pure110+, or equal	
Hilti, Inc.	HIT-RE-500 V3, or equal	
Simpson Strong-Tie Company, Inc.	SET-3G, SET-XP, or equal	
Other	Approved Equal	

3. Acrylic Adhesives:

- a. A two-component, acrylic-based (or hybrid), injectable adhesive system. The adhesive shall be supplied in manufacturer's standard side-by-side cartridge and dispensed through a static-mixing nozzle supplied by the manufacturer.
- b. Products:

Acrylic (or Hybrid) Adhesive Products in Concrete		
Supplier	Products	Compliance
DeWalt	AC200+ or equal	ACI 318, ACI 355.4, ICC-ESR, IAPMO-UES
Hilti, Inc.	HIT-HY-200, or equal	
ITW Red Head	Red Head A7+	
Simpson Strong-Tie Company, Inc.	AT-XP or equal	
Other	Approved Equal	

B. Post-Installed Adhesive Anchoring Systems for Grouted Masonry (CMU):

1. General:

- a. Adhesive anchoring systems for masonry shall be qualified per TMS 402/602.
- b. Adhesive anchoring systems shall have a relative and current evaluation report by ICC-ES and/or IAPMO-UES. Evaluation reports for adhesive anchoring systems shall be qualified for use in masonry resisting seismic and wind forces. Do not use adhesive anchoring systems specified for concrete only in masonry.
- c. Adhesive anchors shall be installed in masonry having a minimum age of 28-days and a minimum compressive strength of 1,500 psi at the time of anchor installation. Do not drill into masonry prior to 28-days.

2. Adhesives:

- a. A two-component high-solids resin and hardener material. The adhesive shall be supplied in manufacturer's standard side-by-side cartridge and dispensed through a static-mixing nozzle supplied by the manufacturer.
- b. Products:

Adhesive Products in Grouted Masonry (CMU)		
Supplier	Products	Compliance
DeWalt	AC100+Gold, or equal	TMS 402/602, ICC-ESR, IAPMO-UES
Hilti, Inc.	HIT-HY 200-R HIT-HY-270, or equal	
Simpson Strong-Tie Company, Inc.	SET-XP, ET-HP or equal	
Other	Approved Equal	

2.06 POST-INSTALLED MECHANICAL ANCHORS

A. Post-Installed Mechanical Anchors in Concrete:

1. General

- a. Applicable to torque-controlled expansion anchors, displacement-controlled expansion anchors, screw anchors, and undercut anchors placed into predrilled holes and anchored in concrete by mechanical means.
- b. Post-installed mechanical anchoring systems for concrete shall be qualified per ACI 318 and ACI 355.2.
- c. Post-installed mechanical anchoring systems shall have a relative and current evaluation report by ICC-ES and/or IAPMO-UES. Evaluation reports for mechanical anchoring systems shall be qualified for cracked concrete in Seismic Design Categories A through F. Do not use mechanical anchoring systems specified for masonry only in concrete.
- d. Post-installed anchors shall be installed in concrete having a minimum age of 21-days unless specifically identified by the manufacturer's written literature, and meets the minimum compressive strength required per the Contract Documents at the time of anchor installation. Do not drill into concrete prior to 21-days.

B. Mechanical Expansion Anchors in Concrete:

1. Mechanical expansion anchors shall be pre-assembled expanding sleeve or wedge type, threaded at one end and a tapered mandrel at the other end enclosed by a three-section expansion element, with nuts and washers.
2. Anchors shall meet the description of Federal Specification A-A 1923A or A-A 1922A, Type 4.
3. Every anchor, if available in one or more length per anchor diameter, shall be marked with the actual numerical length or with the length marking that is visible and legible after installation. The length identification code shall comply with ACI 355.2.
4. Provide hex head stud style anchors unless flat or rod coupler styles, unless otherwise noted on Drawings or in a favorably reviewed deferred submittal.
5. Carbon steel expansion anchors shall receive manufacturer's most corrosion resistant zinc coating. Zinc coating in accordance with ASTM B633, SC1, Type III or B695, or F1941.
6. Products:

Mechanical Expansion Anchors in Concrete

Anchor Type	Material	Products	Compliance
Carbon Steel	Anchor: ASTM A568, Carbon Steel, or equal Expansion Part: ASTM A240, Grade 316 or AISI 304/316, Hex Nuts: ASTM A563, Grade A Washers: ASTM F844	Hilti, Inc. Kwik Bolt-TZ2 Simpson Strong-Tie Strong-Bolt 2, DeWalt Power-Stud SD6, or equal	ACI 318, ACI 355.2, ICC-ESR, IAPMO-UES

Mechanical Expansion Anchors in Concrete

Anchor Type	Material	Products	Compliance
Stainless Steel	Anchor and Expansion Part: AISI 304 or 316 Hex Nuts: ASTM F594, or Type 304, Type 316 Washers: Type 304 or Type 316	Hilti, Inc. Kwik Bolt-TZ2 Simpson Strong-Tie, Strong-Bolt 2, DeWalt Power-Stud SD6, or equal	

A. Post-Installed Mechanical Anchors in Grouted Masonry (CMU):

1. General:

- a. Applicable to torque-controlled expansion anchors, displacement-controlled expansion anchors, and screw anchors placed into predrilled holes and anchored in masonry by mechanical means.
- b. Post-installed mechanical anchors for masonry shall be qualified per TMS 402/602.
- c. Post-installed mechanical anchors shall have a relative and current evaluation report by ICC-ES and/or IAPMO-UES. Evaluation reports for post-installed mechanical anchors shall be qualified for use in masonry resisting seismic and wind forces. Do not use post-installed mechanical anchors specified for concrete only in masonry.
- d. Post-installed mechanical anchors shall be installed in masonry having a minimum age of 28-days and a minimum compressive strength of 1,500 psi at the time of anchor installation. Do not drill into masonry prior to 28-days.

B. Mechanical Expansion Anchors in Grouted Masonry (CMU):

1. Mechanical expansion anchors shall be pre-assembled expanding sleeve or wedge type, threaded at one end and a tapered mandrel at the other end enclosed by a three-section expansion element, with nuts and washers.
2. Anchors shall meet the description of Federal Specification A-A 1923A or A-A 1922A, Type 4.
3. Every anchor, if available in one or more length per anchor diameter, shall be marked with the actual numerical length or with the length marking that is visible and legible after installation.
4. Provide hex head stud style anchors unless flat or rod coupler styles, unless otherwise noted on Drawings or in a favorably reviewed deferred submittal.
5. Carbon steel expansion anchors shall receive manufacturer's most corrosion resistant zinc coating. Zinc coating in accordance with ASTM B633, SC1, Type III or B695, or F1941.
6. Products:

Mechanical Expansion Anchors in Grouted Masonry (CMU)

Anchor Type	Material	Products	Compliance
Carbon Steel	Anchor: ASTM A568, Carbon Steel, or equal Expansion Part: ASTM A240, Grade 316 or AISI 304/316, Hex Nut: ASTM A563, Grade A Washers: ASTM F844	Hilti, Inc. Kwik Bolt-TZ2 Simpson Strong-Tie Strong-Bolt 2, or equal	TMS 402/602, ICC-ESR, IAPMO-UES
Stainless Steel	Anchor and Expansion Part: AISI 304 or 316, Hex Nut: ASTM F594, Type 304, or Type 316 Washers: Type 304 or Type 316	Hilti, Inc. Kwik Bolt-TZ2 Simpson Strong-Tie, Strong-Bolt 2, or equal	

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Comply with this Section and the Contract Documents.
2. Provide grout pads below base of equipment and bearing plates using non-shrink non-metallic grout having a minimum thickness of 3/4-inch and maximum not to exceed thickness of 1-inch, unless otherwise noted. Do not exceed the limits of grout pad thickness without approval from the Engineer.
3. Do not anchor directly to concrete, masonry, or equipment bases.
4. Provide leveling nuts on anchor bolts, below base plates, and adjust to the correct elevation prior to grouting.
5. Do not increase any baseplate or equipment mounting hole diameter, or slot length without the Engineer's approval.
6. Post-Installed Anchors or Post-Installed Reinforcement:
 - a. Where drilling into new or existing concrete and masonry is required, locate, and avoid all reinforcing steel at least 14-days prior to drilling.
 - b. Notify Engineer of any conflicts immediately upon discovery.
 - c. Do not drill through or cut any reinforcing steel without Engineer's approval.
7. Deviations:
 - a. For post-installed anchors (mechanical or adhesive) proposed as a substitute to cast-in-place anchors, submit request for deviation in accordance with the Contract Documents. Submit product data, evaluation reports, and anchorage calculations demonstrating equivalence, sealed, and signed by a Civil or Structural Engineer licensed in the State in which the project is located.

- B. Cast-In-Place Anchors:
 - 1. Set all anchor bolts by template, with provisions to hold bolts rigid and in correct position with respect to plan and elevation.
 - 2. Do not wet-set cast-in-place anchors in concrete and masonry. Wet-setting anchors will not be accepted.
 - 3. Post-installed anchors shall not be substituted for cast-in-place anchors without Engineer's approval.
 - 4. Where anchor straps are shown on the Drawings, do not substitute to anchors without approval from the Engineer.
- C. Post-Installed Adhesive Anchoring Systems:
 - 1. Install adhesive anchors or adhesive reinforcing steel in accordance with the applicable ICC-ES or IAPMO-UES, evaluation report for the specific anchor and manufacturer's instructions.
 - 2. Drill holes only after concrete and masonry has achieved full design strength. Do not drill over-sized holes.
 - 3. Holes shall be drilled perpendicular to the concrete and masonry surface unless shown otherwise on the Drawings.
 - 4. Shim installed anchors to center in holes as necessary.
 - 5. Anchors installed in overhead conditions shall be installed using the manufacturer's recommended piston-plug and nozzle extension tubing.
 - 6. Adhesive anchors are not allowed in overhead applications unless specifically authorized by the Engineer.
- D. Post-Installed Mechanical Anchoring Systems:
 - 1. Install mechanical anchors in accordance with the applicable ICC-ES or IAPMO-UES evaluation report for the specific anchor and manufacturer's instructions.
 - 2. Drill holes only after concrete and masonry has achieved full design strength. Do not drill over-sized holes.
 - 3. Holes shall be drilled perpendicular to the concrete and masonry surface unless shown otherwise on the Drawings.
- E. Repair and Modification of Connections and Anchorages:
 - 1. The Contractor shall pay for all necessary work and material, all redesign work by the Engineer, and all additional Special Inspections and Testing made on welds, bolts, and anchors required to repair or replace faulty work performed during the original fabrication and during erection.
 - 2. Anchors, washers, and nuts that require repair or are required to be replaced due to faulty work performed during installation shall be clearly identified, replaced, and re-tested at no additional cost to the Owner.
 - 3. All materials and all additional documentation to substantiate any faulty or damaged anchors, washers, and nuts in an effort to avoid replacement shall be at no additional cost to the Owner.

3.02 FIELD QUALITY CONTROL

- A. Comply with the requirements of this Section and the Drawings.
- B. Anchoring systems shall be installed in accordance with the applicable ICC-ES or IAPMO-UES, evaluation report for the specific anchor and manufacturer's instructions.
- C. All post-installed anchoring systems shall be Special Inspected in accordance with the Contract Documents. Testing of anchoring systems shall comply with Paragraph

- 1.04.B. Anchoring systems that fail to meet the testing or installation requirements shall be regarded as malfunctioning and shall be considered defective.
- D. Special Inspections and testing shall be independent of the Contractor.
 - E. Anchors should exhibit no discernable movement during load testing.
 - F. Drilled holes that do not set properly or fail during testing may not be reused and shall be abandoned. Notify the Engineer and fill the holes with non-shrink non-metallic grout or epoxy grout. Do not drill additional holes near abandoned drilled holes without the Engineer's approval.

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SECTION 05580
SHEET METAL FABRICATIONS

PART 1 - GENERAL

- A. The work specified in this section includes providing all material and labor necessary to complete installation of stainless steel counters and backsplashes as indicated.
- B. Provide shop drawings for Architect's review.

PART 2 - MATERIALS

- A. #304 stainless sheet metal with #2 matte finish.
- B. 3/4" exterior plywood substrate
- C. Draw bolts at 900 corner connection.
- D. Unistrut supports.

PART 3 - EXECUTION

- A. Fabrication in accordance with SMACNA standards.
- B. Weld, grind and finish joints to match #2 sheet stock.
- C. 4" backsplash @ all walls.
- D. 8" vertical closure at countertop height change.
- E. Stainless steel front apron to cover front edge of counter and unistrut support not to exceed 6 1/2' total height.

END OF SECTION

SECTION 06 17 80

METAL PLATE CONNECTED WOOD TRUSSES

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Design, detail, furnish, install and brace all metal plate connected wood trusses. Includes bridging and bracing for temporary and permanent placement.

1.02 REFERENCES

A. Truss Plate Institute:

1. ANSI/TPI1 2022 National Design Standard for Metal Plate Connected Wood Truss Construction with Commentary and Appendices
2. ANSI/TPI2 2022 Standard for Testing Metal Plate Connected Wood Trusses
3. DSB-89 Recommended Design Specification for Temporary Bracing of Metal Plate Connected Wood Trusses
4. WCTA/TPI BCSI 1-03 Guide to Good Practice for Handling, Installing and Bracing of Metal Plate Connected Wood Trusses
5. TPI-85 Design Specification for Metal Plate Connected Wood Trusses (Roof)
6. HET-80 Handling and Erecting Wood Trusses: Commentary and Recommendations
7. QST-88 Quality Standard for Metal Plate Connected Wood Trusses

B. National Forest Products Association: "National Design Specification for Wood Construction," (NDS) 2018 Edition.

C. Wood Truss Council of America:

1. In-Plant Quality Procedure Manual for MPC Wood Trusses.
2. Metal Plate Connected Wood Truss Handbook.
3. Building Component Safety Information BCSI 1-03.

D. California Building Code (CBC) 2022.

E. American Society of Civil Engineers: Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16).

1.03 SYSTEM DESCRIPTION

A. Design Requirements:

1. Metal Plate Connected Wood Trusses: Designed by the metal connector plate manufacturer and manufactured by a truss manufacturer licensed or authorized by the connector plate manufacturer.
2. Furnish truss design drawings and calculations for metal plate connected wood trusses that are prepared, sealed and signed by a Professional Civil or Structural Engineer registered in the State of California.

- B. Design Criteria:
 - 1. The Specialty Engineer shall follow the structural design parameters and loading diagrams listed on the Structural Drawings.
- C. Design Standard: Comply with applicable provisions of the National Design Specifications for Wood Construction by the National Forest Products Association, Design Specification for Metal Plate Connected Wood Trusses by the Truss Plate Institute and Design and Manufacturing Specifications of the Wood Truss Council of America.

1.04 SUBMITTALS

- A. Product Data: Fully describing all items proposed for use.
- B. Truss Submittal Package:
 - 1. Engineering design calculations prepared, sealed and signed by a Civil or Structural Engineer registered (licensed) in the State of California. Include load combinations required by ASCE 7-16 and the 2022 CBC.
 - 2. Truss design drawings shall include, at a minimum, the information specified below:
 - a. Slope or depth, span and spacing of trusses.
 - b. Location of joints.
 - c. Required bearing widths.
 - d. Design loads, as applicable.
 - 1) Top chord live load where controlling.
 - 2) Top chord dead load.
 - 3) Bottom chord live load.
 - 4) Bottom chord dead load.
 - 5) Concentrated loads and their points of application.
 - 6) Wind and seismic criteria.
 - e. Adjustments to lumber and metal connector plate design value for conditions of use.
 - f. Reaction forces, their points of occurrence and direction.
 - g. Metal connector plate type, size, thickness or gage, and the dimensioned location of each metal connector plate except where symmetrically located relative to the joint interface.
 - h. Lumber size, species and grade for each member.
 - i. Connection requirements for:
 - 1) Truss to truss;
 - 2) Truss ply to ply; and
 - 3) Field splices.
 - j. Calculated deflection ratio and maximum vertical and horizontal deflection for live and total load.
 - k. Maximum axial tensile and compression forces in the truss members.
 - 3. Truss placement diagram:
 - a. Identifying proposed location for each individually designated truss.
 - b. Referencing the corresponding truss design drawing.
 - c. To be provided as part of the truss submittal package, and with the shipment of trusses delivered to the job site.
 - 4. Design and furnish temporary and permanent bracing drawings of truss members and showing brace locations, construction and attachment. Provide more restrictive permanent bracing if a specific truss member permanent bracing plan for the roof or floor structural system is shown.
 - 5. Cover sheet/truss index sheet.

- C. Quality Control Submittals:
1. Design Data: Truss design drawings and calculations prepared, signed and sealed by a Registered Professional Engineer in the State of California.
 2. Test Reports: Validating the design assumptions.
 3. Manufacturer's Certificates: Signed by the metal connector plate manufacturer and the truss manufacturer certifying that trusses meet specified requirements and are manufactured in plants inspected at least quarterly by Timber Products Inspection, Portland, Oregon; Product Fabrication Service (PFS); CBO or CABO Certified Inspection Service; or equal.
 4. Manufacturer's Instructions: Indicating required preparation, installation procedures, attachment and bracing.

1.05 QUALITY ASSURANCE

- A. Qualifications:
1. Manufactured in a plant that is inspected at least quarterly by Timber Products Inspection Service (TPI) to verify:
 - a. Compliance with ICC standards,
 - b. Manufacturing tolerance and lumber grades,
 - c. The plant uses plate connectors and truss designs prepared in accordance with the standards of ICC, the Truss Plate Institute and the Wood Truss Council of America.
- B. Regulatory Requirements: Comply with requirements of California Building Code, including without limitation, Chapters 16 and 23.

1.06 DELIVERY, STORAGE AND HANDLING

- A. Deliver trusses strapped together in bundles by truss type and labeled indicating installed location.
- B. Store trusses elevated above the ground on wood sleepers. Cover trusses with tarpaulins to protect from rain and sun.
- C. Handle trusses during fabrication, delivery and at jobsite so as not to be subjected to excessive bending.
- D. Unload trusses on smooth ground to avoid lateral strain. Protect trusses from damage that might result from on-site activities and environmental conditions. Prevent toppling when banding is removed.
- E. Handle during installation in accordance with latest version of Building Component Safety Information (BCSI 1) from TPI, and ANSI/TPI 1. The truss installer shall install trusses in a manner consistent with good workmanship and good building practices.
- F. Inspect trusses upon delivery and prior to installation, report apparent damage to trusses to Manufacturer prior to installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Truss Design and Metal Connector Plate Manufacturer: Alpine Engineered Products Inc.; MiTek Industries; or equal.

- B. Truss Manufacturer/Installer: Truss Components; Precision Truss and Lumber Inc; Pacific Lumber & Truss; or equal.

2.02 METAL PLATE CONNECTORS

- A. Provide metal connector plates designed and tested in accordance with ANSI/TPI 1 and ANSI/TPI 2.
- B. Metal Connector Plates:
 - 1. Shall not be less than .0356 inches in thickness (20 gauge) steel.
 - 2. Shall meet or exceed ASTM A653 Grade 37.
 - 3. Shall be hot-dipped galvanized according to ASTM A653 coating designation G60. In highly corrosive environments, special applied coatings or stainless steel may be required.
- C. Code Approval: ICC, Evaluation Report.
- D. Quality Control: In-house quality control program by inspectors certified quarterly by PFS. Monitor all phases of production: steel thickness, galvanized coating, yield and tensile strength as well as nail bend ductility, sharpness and holding value, to be equal to requirements of ICC and Truss Plate Institute.

2.03 LUMBER

- A. Grade and species: as required by truss design.
- B. Moisture content of lumber: no greater than 19% at time of fabrication.
- C. Adjustment of values for duration of load or conditions of use: in accordance with National Design Specifications for Wood Construction (NDS).
- D. Defects including wane or knots occurring in the connector plate area must not affect more than 10% of required plate area or number of effective teeth required for each truss member.
- E. Fire retardant treated (FRT) lumber, if specified: meet specifications of truss design, use category UCFA, as specified by the American Wood Protection Association, Section 2303.2 of the CBC, and ANSI/TPI 1, par. 6.4.9 and NDS par. 2.3.4.
- F. Supply certificate of compliance by lumber treater including:
 - 1. Specified design values and use conditions,
 - 2. Minimum acceptable galvanizing level for galvanized steel fasteners used with their FRT lumber.

2.04 TRUSS MANUFACTURER

- A. Cut all members for accurate fitting joints. Comply with joint tolerance requirements in QST 88 by the Truss Plate Institute.
- B. Apply connector plates to both faces of truss by hydraulic press or roller. Seat plates firmly against wood truss members.
- C. Maintain joint fit tolerance and connector plate installation tolerance in accordance with ICC and Wood Truss Council requirements.
- D. Quality Control: At least quarterly, plant and sample project run inspection by third party ICC-certified inspectors: Timber Products Inspection, Portland, Oregon; or equal. Inspection to cover without limitation:
 - 1. Compliance with approved engineering drawings.

2. Connector plate size, gauge and type.
3. Lumber species, grade and moisture content.
4. Location of lumber defects clear of connector plate area.
5. Accuracy of fit of truss members.
6. Installation of connector plates driven up tight against wood members.

PART 3 - EXECUTION

3.01 GENERAL

- A. Set trusses shall be set and secured level and plumb, and in correct location. Hold trusses in correct alignment until specified permanent bracing is installed.
- B. Cutting and altering of trusses after manufacture is not permitted.
- C. Install trusses by or under the direct supervision of the truss manufacturer. Install and attach trusses in accordance with requirements of ICC, Truss Plate Institute and Wood Truss Council of America unless more restrictive requirements are shown. Follow erection recommendations in "Commentary and Recommendations for Handling and Erecting Wood Trusses" by the Truss Plate Institute.
- D. Comply with requirements for temporary bracing during construction and permanent installation bracing contained in "Bracing Wood Trusses" BWT 76 by the Truss Plate Institute. Provide erection bracing adequate to hold trusses straight and plumb in safe conditions until decking and permanent bracing is in place. Complete all permanent truss bracing before applying any loads to roof. Provide permanent bracing in accordance with truss designer's drawings and Contract Drawings.
- E. Concentrated loads shall not be placed atop trusses until all specified bracing has been installed and decking is permanently nailed in place. Specifically avoid stacking full bundles of decking or other heavy materials onto unsheathed trusses.
- F. Erection bracing is always required. Prevent topping of trusses during installation.
- G. The Contractor is responsible for obtaining and furnishing the materials used for installation and permanent bracing.

END OF SECTION

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SECTION 07600
FLASHING AND SHEET METAL

PART 1 - GENERAL

A. Description:

1. Scope: Furnish and install all sheet metal fabrications required to complete the work shown on the Drawings and specified herein.
2. Standards: The methods of fabrication, assembly and installation shall comply with the standards of the SMACNA Handbook (current edition).

B. Approvals:

1. Code: C.B.C.
2. Appearance: Owner's Representative.

PART 2 - GENERAL

- A. Sheet metal: 26 gauge galvanized sheet metal.
- B. Solder: 50:50 alloy lead-tin.
- C. Flux: Non-corrosive.
- D. Fastenings: galvanized roofing nails.

PART 3 - EXECUTION

- A. Installation of galvanized sheet metal by experienced craftsmen as required to produce watertight connections and intersections.
- B. Details appearing in SMACNA Handbook only unless approved in writing by Owner's Representative.

END OF SECTION

SECTION 07 61 10
METAL ROOFING PANELS

PART 1 - GENERAL

1.1 SUMMARY:

Scope of Work

- A. Furnish and Install Preformed Metal Roofing System with continuous interlocking panel connections.
- B. Provide all necessary accessories, ridges, hips, valleys, eaves, rakes, corners, miscellaneous flashing, attachment clips and closure members to ensure a weathertight installation.

1.2 SECTION INCLUDES

- A. Preformed aluminum roof panels.
- B. Flashings, fasteners, and accessories as required for weatherproof installation.

1.3 RELATED SECTIONS

- A. Section 07 60 00 - Flashing and Sheet Metal.

1.4 REFERENCES

- A. AAMA 608.1 - Voluntary Guide Specification and Inspection Methods for Electrolytically Deposited Color Anodic Finishes for Architectural Aluminum; American Architectural Manufacturers Association.

1.5 PERFORMANCE REQUIREMENTS

- A. Design Requirements:
- B. Provide UL90 Rated Roof System that has been tested in accordance with UL580 test procedure.
- C. System shall meet performance criteria as installed.
- D. Performance Criteria: Roof system shall conform to structural requirements as it relates to the substrate to which the roof panels are applied.
- E. System Movement: Accommodate movements due to thermal expansion and contraction, dynamic loading, and deflection of structural support system without damage to panel system or loss of weatherproofing capability.
- F. Drainage: Provide positive drainage to exterior for moisture entering building enclosure or condensation occurring within exterior building envelope.
- G. Fabricate panels in full length with no transverse seams when panel lengths are 70'-0" or less. The use of transverse seams shall be acceptable for lengths greater than 70'0". Manufacturer's details for end lap conditions shall be strictly adhered to.
- H. All panels shall be fastened to the framing members or underlayment with concealed anchor clips designed to

SECTION 07 61 10
METAL ROOFING PANELS

allow for thermal movement of the panels, except where specific fixed points are required.

- I. Roof panels, anchor clips, closures, flashings and accessories shall be the product of a single manufacturer.
- J. All trim and flashing components shall be fabricated in lengths of 12'-0" to minimize joint details. Allowance for thermal expansion and contraction of trim and flashing components shall be incorporated in their design.

1.6 SUBMITTALS

- A. Product Data: Submit manufacturer's current product specifications and installation instructions.
- B. Shop Drawings: Include small scale roof plan and elevations, as required. Show details of trim and flashing conditions, fastening and anchoring methods, weatherproofing techniques, terminations, and penetrations.
- C. Selection Samples: Submit actual metal chips with full range of colors available for District's selection.
- D. Verification Samples: Submit two samples of each type of metal panel required, not less than 12 inches, and illustrating finished panel profile, color, sheen, and texture.
- E. Test Reports: Submit copies of test reports verifying performance capability of panel system.
 - 1. ASTM E-1592.
 - 2. Clip Fastener Pull Out Test and Calculations.
 - 3. UL580 Class 90 Test Data.
 - 4. Air Infiltration (ASTM E-283) and Water Penetration (ASTM E-331) Test Data.
 - 5. Coating Performance Test Data (See Section 2.3 Finishes).
- F. Certified statement from the roofing panel manufacturer that the manufacturer has a minimum of ten (10) years' experience in the roll forming process of metal roofing systems.
- G. Certified statement from the roofing panel manufacturer that the roofing panel is tension leveled during the roll forming process.

1.7 QUALITY ASSURANCE

- A. Manufacturer's Qualifications:
 - 1. All panels are to be factory formed and packaged per job requirements.

SECTION 07 61 10
METAL ROOFING PANELS

2. Manufacturer shall have a minimum of ten (10) years' experience in the factory fabrication of metal roof panels.
 3. Specification is based upon the products of ATAS International, Inc. No other manufacturer of metal roof systems shall be accepted as an alternate product without prior written approval. These substitution requests must meet specifications and must be submitted a minimum of ten (10) days prior to date of bid.
 - B. Installer: Company specializing in the type of work required for this project, with not less than 2 years of documented experience.
 - C. Regulatory Requirement: All local building code requirements are to be followed for both design and installation of metal roof system.
 - D. Pre-Installation Meeting: Convene meeting not less than one week prior to beginning installation.
- 1.8 DELIVERY, STORAGE AND HANDLING
- A. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.
 - B. Protect materials from damage during transit and at project site. Store under cover but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.
 - C. Do not allow storage of other materials or allow staging of other work on installed metal panel roof system.
 - D. Upon receipt of delivery of metal roof system, and prior to signing the delivery ticket, the installer is to examine each shipment for damage and for completion of the consignment.
- 1.9 FIELD MEASUREMENTS
- A. Field measurements should be taken by the installer for verification of dimensional correctness in relationship to original plans, prior to providing manufacturer with a bill of material.
- 1.10 SEQUENCING AND SCHEDULING
- A. Installer shall coordinate with general contractor as to scheduled delivery time after receipt of field verified bill of material by manufacturer as it relates to actual project scheduling.

SECTION 07 61 10
METAL ROOFING PANELS

1.11 WARRANTY

- A. Submit manufacturer's standard 20 year finish warranty for color retention, adhesion, and freedom from chalking.
- B. Submit 2 year weather tightness and workmanship warranty from installer.

PART 2 - MATERIALS

2.1 MANUFACTURERS

- A. Design is based on products manufactured by
 - 1. ATAS International, Inc., 6612 Snowdrift Road Allentown, PA 18106. Telephone: 610-395-8445.
- B. Requests to use alternate systems must be submitted in writing to the project architect at least ten (10) days prior to bid date. Submitted items must be per provision noted in section 1.6 of this project specification.

2.2 MATERIALS

- A. Aluminum Sheet: ASTM B 209 Prefinish as specified under panel type.

2.3 FINISHES

- A. Fluoropolymer Coating: Provide multi-coat PVF2 Kynar 500(r)/Hylar 5000(r) finish system on exposed metal surfaces.

2.4 PANEL SYSTEMS:

- A. ATAS International, Inc. Dutch Seam (11" or 15" o.c. standing seam with stiffening ribs) 0.040 aluminum panels with Kynar 500 finish, color to be selected by District.

2.5 FABRICATION

- A. Panels:
 - 1. Factory fabricated in a controlled environment.
 - 2. Panels to be tension leveled during rollforming process.
 - 3. Panels to be produced in longest lengths possible, except when modular units are utilized.
- B. Accessories: Factory fabricate trim and flashing components in standard 12 foot lengths.
- C. Form all components true to shape, accurate in size, square and free from distortion or defects. Cut panels to precise lengths indicated on approved shop drawings or as required by field conditions.

SECTION 07 61 10
METAL ROOFING PANELS

2.6 ACCESSORIES

- A. Provide formed accessories of same gauge and finish as the primary panel system, unless otherwise indicated on the drawings.
- B. Fasteners: Corrosion resistant fasteners as required for project conditions and panel type.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Installer shall examine all substrates on which panel system and accessories are to be applied.
 - 1. If surfaces are not suitable for application of panel system, installer shall notify the architect in writing.
 - 2. Installation shall not proceed until surface is acceptable to all parties.
- B. Installer must field verify all necessary dimensions prior to fabrication of materials.

3.2 INSTALLATION

- A. Install metal panels and accessories in strict accordance with ATAS International, Inc. instructions.
- B. Protect surfaces from contact with cementitious materials and other dissimilar metals with bituminous paint or other coatings.
- C. Fasten panels to structural support with fasteners provided or approved by panel manufacturer. Install panels plumb, level, and true to line.
- D. Fully interlock panels or nest with adjacent panels; apply sealants as required to achieve weathertight installation.
- E. Install roof panels with no transverse seams, unless a modularized system is being utilized.
- F. Remove protective masking from panels immediately after each panel is installed.
- G. Do not allow shavings, metal dust or chips to fall on panels.
- H. Care should be taken during handling of panels to prevent bending, twisting, abrasion, scratching, denting, etc.
- I. Workmanship to comply with standards established by the Architectural Sheet Metal Community.

3.3 ADJUSTING AND CLEANING

- A. Touch up minor abrasions with matching paint provided by panel manufacturer. Remove and replace panels that

SECTION 07 61 10
METAL ROOFING PANELS

- cannot be satisfactorily touched up. See Metal Construction Association Technical Bulletin #95-1051.
- B. Sweep and remove chips, shavings and dust from roof on a daily basis during installation period. Leave installed work clean, free from grease, finger marks and stains. Remove all protective masking from material immediately after installation of product.
 - C. Upon completion of installation, remove scraps and debris from project site.

3.4 PROTECTION

- A. Provide protection as required to assure that completed work of this section will be without damage or deterioration at date of substantial completion.
- B. Safety clothing, equipment and precautions must be utilized according to safety standards.

END OF SECTION

SECTION 07 62 00

FLASHING AND SHEET METAL

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Stainless steel and aluminum sheet metal flashing, counterflashing, gutters, rainwater leaders, copings, expansion joints, and all other sheet metal work not covered in other sections.

1.02 REFERENCES

- A. "Architectural Sheet Metal Standards" by Sheet Metal and Air Conditioning Contractors National Association (SMACNA), latest edition.
- B. ASTM International (American Society for Testing and Materials - ASTM):
 - 1. A240 Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
 - 2. A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 3. A924 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
 - 4. B29 Standard Specification for Refined Lead
 - 5. B32 Standard Specification for Solder Metal
 - 6. B209 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
 - 7. B370 Standard Specification for Copper Sheet and Strip for Building Construction
- C. California Building Standards Commission
 - 1. 2022 California Building Code (CBC) (California Code of Regulations, Title 24)
- D. Federal Specification (FS)
 - 1. FS UU-B-790A Building Paper, Vegetable Fiber: (Kraft, Waterproofed, Water Repellent and Fire Resistant)
- E. National Roofing Contractors Association (NRCA)
 - 1. The NRCA Roofing Manual

1.03 SUBMITTALS

- A. Product Data: Fully describe all manufactured items to be furnished.
- B. Shop Drawings: Show all custom-fabricated items clearly illustrating the design, dimensions, materials, methods of construction and installation of each piece of work.
- C. Manufacturers' Instructions: For manufactured items.

1.04 QUALITY ASSURANCE

- A. Comply with the adopted edition of the California Building Code (CBC).

- B. Where specific details are not provided comply with applicable details in the SMACNA Architectural Sheet Metal Standards.
- C. Except where otherwise indicated, comply with minimum thickness or gage requirements as specified in SMACNA Architectural Sheet Metal Manual.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. For unpainted items, deliver all items to the job site in sufficient time for field priming and incorporation into work of other trades.
- B. Store materials under dry conditions and protect from moisture and physical damage.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Aluminum: 6061-T6 alloy, meeting ASTM B209, 0.064-inch thick or heavier where noted.
- B. Stainless Steel: Type 304, 2B finish unless a higher polish is noted, ASTM A240, 26-gauge or heavier where noted.
- C. Sheet Lead: ASTM B29; weighing 4.0 pounds per square foot (0.062-inch thick) for flashing of vent pipes and other penetrations of the roof.
- D. Solder: ASTM B32, low lead solder. Use special solder for stainless steel.
- E. Flux: Noncorrosive; use an approved brand for the type of metal.
- F. Fasteners:
 - 1. To Concrete Masonry Units: Deformed steel wedge pins driven into lead expansion shields; RAWL, Tapcon, or equal.
 - 2. To Wood Nailers and Sills: Pan head, noncorrosive, sheet metal screws.
 - 3. Component Fasteners: Self-drilling/self-tapping, stainless steel screws, type S 12, Buildex TEKS; Fastenal; or equal.
 - 4. Screw heads shall be furnished with neoprene washers.
- G. Seamless Aluminum - 0.032 gutters; 4x4 box gutter with a factory finish consisting of pretreatment plus a baked on primer and finish coat.
- H. Downspouts: Minimum 3-inch-square downspouts with a baked on primer and finish coat.
- I. Sealant: Polyurethane sealant type "B" as specified in Section 07 92 00. Where specified sealant is incompatible with other adjacent sealants, Contractor shall submit a sealant suitable for intended use and of equivalent life expectancy.

2.02 FABRICATION

- A. Before fabrication, take field measurements, ascertain existing field conditions and have discrepancies corrected before proceeding with sheet metal work.
- B. Fabricate sheet metal items in the shop to the greatest extent possible. Fabricate using techniques and methods described in the SMACNA Architectural Sheet Metal Standards.

- C. Make sections uniform with true, straight breaks, accurately fitted and rigidly secured. Provide overlapping tabs for soldered joints. Fabricate items in maximum lengths.
- D. Provide accessories necessary to complete installation. Provide ribs, cleats, stiffeners, sleeves, hangers and other reinforcements required to make sections rigid and substantial, in same metal as basic unit.
- E. Miter corner joints and reinforce with extended tabs or backing plates.
- F. Soldering: All soldered joints shall lap at least 1-inch. Pre-tin and sweat-solder joints full width. Reinforce all soldered joints with metal rivets. Do not solder aluminum.
- G. Lap expansion joints at least 4 inches and seal with polyurethane sealant, type "B".

2.03 FLASHING FOR VENT PIPES THROUGH ROOF

- A. Fabricate a 26-gauge minimum, stainless steel - 0.020" conical Flashing collar with roll-formed flared bottom edge, lapped and sweat-soldered watertight to 26-gauge minimum, stainless steel - 0.020" bottom flange.
- B. Fabricate a separate sheet lead Counterflashing collar to fit around vent pipe and overlap conical Flashing collar. The top of Counterflashing to be bent down inside the pipe.

2.04 FLASHING FOR CONTINUOUS PIPES AND CONDUITS THROUGH ROOF

- A. Fabricate a conical Flashing collar same as for vent pipes (paragraph 2.03A above).
- B. Fabricate a separate sheet lead Counterflashing collar to fit around pipe and overlap conical Flashing collar. Furnish a stainless-steel draw band with stainless steel tightening bolt. Seal the joint in the lead Counterflashing and the joint between the Counterflashing and the pipe with polyurethane sealant.

PART 3 - EXECUTION

3.01 INSPECTION

- A. Examine surfaces to receive sheet metal work for defects that will adversely affect the execution and quality of the work.
- B. Do not start work until all unsatisfactory conditions are corrected.
- C. Ensure that all wood nailers have been properly installed.
- D. Ensure that all galvanized sheet metal items are prime coat painted on all concealed and exposed surfaces, under Section 09 91 00, before installation.

3.02 WORKMANSHIP

- A. All work shall be watertight and shall drain properly.
- B. Make proper allowance for expansion and contraction of the metals and of the materials to which they are fastened.

- C. Form work accurately to sizes, shapes, and dimensions indicated or necessary, with angles and lines in true alignment, straight and sharp; miters and joints accurately fitted.
- D. Erect work plumb, level and in proper plane, without bulges, or waves. Fit metal closely and neatly to cores or framework. Cope or flange intersections to fit accurately. Reinforce heavily loaded joints with screws or rivets. Corners shall be reinforced and seams made waterproof. Exposed work shall be free of dents and other defects. Edges of sheet metal shall be hemmed.
- E. Soldering: Pre-tin and apply flux to surfaces of sheet metal. Slowly and thoroughly apply heat to completely sweat the solder through the full width of seam.
- F. Set items in sealant or plastic cement as shown or noted; or when such application is necessary to provide a watertight job.
- G. Provide isolation between dissimilar metals or other materials with sealant, butyl tape, bituminous paint or asphalt saturated felt. Provide waterproof neoprene washers wherever fasteners penetrate sheet metal. Exposed fasteners will not be permitted for any portion of this work.
- H. Perform sealant work in conformance with the requirements of Section 07 92 00.

3.03 FLASHING

- A. Install all Flashings as required to provide watertight protection.
- B. Lap all seams in direction of water flow.
- C. Carry Flashings around corners at least 4 inches.
- D. Lap joints 4 inches minimum. Apply sealant to the overlapping surfaces of the joints. Beads of sealant which will be concealed in the finished work shall be continuous with no voids of material.
- E. Flashing for roof penetrations shall be accurately formed to conform with roofing contours and configurations, and as required for watertight installation. Flashing shall be built in while the roofing work is in progress.

3.04 INSTALLATION

- A. At Vent Pipes Through Roof:
 - 1. Per paragraph 2.03, provide conical Flashing collar with roll-formed bottom flange soldered to base Flashing. The base Flashing shall extend 8 inches minimum from the base of the conical collar all around.
 - 2. Provide a separate Counterflashing collar for the top of the vent pipe.
- B. Flashing at Round Ducts, Conduits, and other Pipe Through Roof:
 - 1. Per paragraph 2.04, provide a conical Flashing collar same as for vent pipes.
 - 2. Provide a separate Counterflashing collar over the conical collar. Use a stainless-steel draw band to fasten top of Counterflashing around the pipe or conduit. Embed Counterflashing in a 2-inch-wide bed of sealant and apply a large bead of sealant to the top exposed edge.
- C. Flashing at Curb Mounted Equipment, Skylights, Chimneys, and Similar Rectangular Projections Through Roof:
 - 1. Fold Flashings at least 4 inches around corners and lap in the direction of water or wind.

2. Provide a shop fabricated saddle Flashing (cricket) at the uphill side of skylights and equipment curbs installed on roofs sloping more than 1/4-inch per foot.
 3. Lap end joints 4 inches and seal with sealant.
- H. Seamless Aluminum Rainwater Gutters and Rainwater Downspouts:
1. Install gutters along roof edge using stainless steel fasteners. Seal joints in accordance with manufacturer's recommendations.
 2. Install rainwater downspouts 3 inches square with all related fittings. Connect downspouts to rain gutters where shown using special gutter fittings with downspout sleeve. Seal all joints. Attach to building with matching prefinished straps and stainless-steel fasteners.
- I. Roof Flashing: Lap joints 3 inches minimum. Lap, miter, and solder at corners.
- J. Provide sill and head Flashing at all louvers as shown and as required for a watertight installation. Furnish in the same metal as the louver. Louvers are specified under Division 8.
- K. Provide Flashing where shown and where required for a watertight installation.
- 3.05 CLEANUP
- A. Clean all finished surfaces, removing all solder, flux, etc. Neutralize soldering flux with a 5 to 10 percent washing soda solution, wash down all work with soap and hot water, flush with clean water, and wipe dry.
 - B. Repair or replace all damaged or defective areas to ensure water tightness and neat appearance.

END OF SECTION

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SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Sealant work required:
 - a. For a watertight project.
 - b. Required by code and not specifically covered in another section.
 - 2. Minimum standards for all sealant work whether covered in this Section or in other sections.

1.02 REFERENCES

- A. Federal Specifications:
 - 1. TT-S-00-230C Sealing Compound: Elastomeric Type, Single Component (For Caulking, Sealing and Glazing in Buildings and Other Structures)
 - 2. TT-S-00-227E Sealing Compound: Elastomeric Type, Multi-Component (For Caulking, Sealing and Glazing in Buildings and Other Structures)
 - 3. TT-S-00-1543A Sealing Compound: Silicone Rubber Base (For Caulking, Sealing and Glazing in Buildings and Other Structures)

1.03 SUBMITTALS

- A. Product Data: Fully describe all products proposed for use.
- B. Samples: Physical samples of cured sealants for selection of colors.
- C. Manufacturer's Instructions: Application instructions for all products used.

1.04 QUALITY ASSURANCE

- A. Qualifications: The joint sealant work shall be provided by a licensed Specialty Sealant and Waterproofing Contractor who is engaged exclusively in the installation of joint sealants, has satisfactorily completed at least five (5) similar installations within the last two (2) years, and approved by the sealant material manufacturer. All work to be performed by qualified journeymen proficient in the craft of sealant application.
- B. Regulatory Requirements: Comply with the California Building Code (CBC), 2022 edition.

1.05 PROJECT CONDITIONS

- A. Environmental Requirements: Apply sealant only when temperature and humidity conditions are at the levels recommended by the sealant manufacturer.

1.06 SPECIAL GUARANTEE

- A. Provide a written Special Guarantee in accordance with Section 00 72 13 covering replacement of sealant work that fails within 2 years of the date of project acceptance. Failure includes:
1. Becoming brittle or cracking due to exposure, contraction or expansion.
 2. Failure to resist abrasion of normal use and traffic.
 3. Tear failure due to movement within 50% of joint width for Class A sealants.
 4. Cohesive or adhesive failure due to movement within 50% of joint width for Fed. Spec. Class A sealants.
 5. Water infiltration for joints intended to exclude water, air infiltration for joints intended to exclude air.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Sealant Type "A": Exterior and interior horizontal traffic deck sealant two-part self-leveling polyurethane with a Shore "A" hardness greater than 30, conforming to Fed. Spec. TT S 00227E Type I or Type II, Class A, in color selected. Acceptable products are:
1. Tremco "Vulkem" No. 245 (use with recommended primer).
 2. W.R. Meadows "Pourthane" NS used with recommended primer.
 3. Or equal.
- B. Sealant Type "B": Exterior and interior vertical surface sealant (location as approved by manufacturer) for use in joints in concrete, metal and similar materials, conforming to Fed. Spec. TT S 00230C Type II, Class A, in color selected. Acceptable products are:
1. One part polyurethane: Tremco "Vulkem" No. 116 (approved for exterior use only).
 2. One part polyurethane: Sika Sealant Division Sikaflex Ia.
 3. Or equal.
- C. Sealant Type "C": Paintable silicone sealant suitable for sealing cracks, voids, joints, etc. in exterior or interior surfaces that are to be painted or left unpainted. Acceptable products are:
1. G.E. Paintable Silicone Sealant.
 2. Dow Corning Paintable Silicone Sealant.
 3. Or equal.
- D. Sealant Backup: Closed-cell polyethylene rod stock. Acceptable products are:
1. Dow Corning "Ethafoam."
 2. Hercules, Inc., HBR Backer Rod.
 3. Or equal.
- E. Sealant Tape: Resilient, non-staining, 100% butyl rubber, self-adhering, extruded sealant tape containing no asphalts. Acceptable products are:
1. Chemtron, "Tapeseal 303",
 2. Tremco 440 Tape,
 3. Or equal.

PART 3 - EXECUTION

3.01 CONDITION OF SUBSTRATE

- A. Allow concrete and masonry to cure for at least 28 days before applying sealants.
- B. Inspect substrates to receive sealant work for:
 - 1. Deviation beyond allowable tolerance for joint width and required clear joint depth. Joint width shall not be less than 1/4-inch or the width shown.
 - 2. Presence of contaminants, which cannot be removed by normal joint cleaning.
 - 3. Presence of moisture. Joint surfaces shall be dry.
- C. Do not start work until unsatisfactory conditions are corrected.

3.02 PREPARATION OF SURFACES

- A. Clean surfaces to which sealant is to be adhered:
 - 1. For Concrete and Masonry: Sandblast joint surfaces taking care to protect exposed finish surfaces.
 - 2. For Metal: Sand or scrape and solvent clean with a non-film forming solvent.
 - 3. For Wood: Sand or scrape.
- B. Ensure that cleaned surfaces are not contaminated before applying sealant.

3.03 APPLICATION

- A. Follow sealant manufacturer's published instructions.
- B. Install sealant backup the proper distance from face of joint for joint proportioned in accordance with sealant manufacturer's recommendations. Use polyethylene rod stock larger than joint so that backup can be firmly held in place.
- C. Apply primer and/or cleaner conditioner recommended by sealant manufacturer for substrate. Avoid getting primer on the face of material or on areas that will not be covered by sealant.
- D. Mask edges of joint with masking tape where required to avoid contamination of exposed surfaces adjacent to joint.
- E. Apply self-leveling sealant by pouring, pumping or with a caulking gun. When using pump or caulking gun fill joint from the bottom up to avoid air entrapment. Fill joint flush with surface of adjacent material without overfilling or spilling sealant on exposed surfaces.
- F. Apply vertical grade sealants by hand or power operated caulking gun. Use a caulking tip the proper width for the joint required. Fill the joint from the bottom up to insure a fully filled joint without entrapped air bubbles or voids. Use lubricant recommended by sealant manufacturer to tool joints. Force sealant against sides and bottom of joint and into all crevices; press out air bubbles and voids. Tool sealant surface smooth and flush with adjacent surfaces for butt joints or to an even, straight-sided fillet of uniform width and slope for fillet joints.
- G. Where the substrate or adjacent sealants are incompatible with the specified sealant, submit a sealant suitable for the required use and of equivalent life expectancy to the specified sealant.

3.04 CLEANUP

- A. Upon completion, remove protective masking and clean any sealant from adjacent finished surfaces beyond edge of joint.

END OF SECTION

SECTION 08 11 13

DOORS

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. All hollow metal work including:
 - a. Doors and frames.

1.02 REFERENCES

- A. American National Standards Institute (ANSI):
 - 1. ANSI A250.4 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors
 - 2. ANSI A250.8 Specifications for Standard Steel Doors and Frames
- B. ASTM International (ASTM):
 - 1. ASTM A1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable
 - 2. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
 - 3. ASTM A1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength
 - 4. ASTM C1363 Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus
 - 5. ASTM E283 Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- C. California Building Standards Commission
 - 1. 2022 California Building Code (CBC), California Code of Regulations, Title 24
 - 2. 2022 California Energy Code (CEC), California Code of Regulations, Title 24
- D. National Association of Architectural Metal Manufacturer's (NAAMM) "Guide Specification for Laminated Core Hollow Metal Doors and Frames, HMMA 867-16.
- E. Steel Door Institute (SDI):
 - 1. ANSI/SDI A250.4 Standard Test Procedure and Acceptance Criteria for Prime-Painted Steel Surfaces for Steel Doors and Frames.
 - 2. ANSI/SDI A250.8 Recommended Specifications for Standard Steel Doors and Frames.

- F. Underwriters Laboratories, Inc.:
 - 1. UL 1784 Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives

1.03 SUBMITTALS

- A. Product Data: Fully describe all products proposed for use. Include data and details on door construction including internal reinforcement and door edge construction.
- B. Shop Drawings: Submit custom prepared project-specific shop drawings showing dimensions and details. Include a schedule showing locations of doors and frames complete with listing of types and styles. Field measure before ordering. Provide frames with throat opening size required by field conditions regardless of size shown on drawings. Review of door frame submittal DOES NOT include review of throat opening dimension for compatibility with field requirements or Contract Documents.
- C. Manufacturers' Certificates of Compliance: Before delivery of doors, frames, and accessories, submit certificates from the manufacturer attesting that doors, frames and accessories meet the requirements of the referenced standards.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements:
 - 1. Comply with the following:
 - a. 2022 California Building Code
- B. Energy Efficient Exterior Openings: Comply with minimum thermal ratings, based on ASTM C1363. Openings to be fabricated and tested as fully operable, thermal insulating door and frame assemblies.
 - 1. Thermal Performance (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM C1363 and meet or exceed the door assembly operable U-Factor and/or R-Value ratings (including insulated door and thermal-break frame) as shown on Drawings.
 - 2. Air Infiltration (Exterior Openings): Independent testing laboratory certification for exterior door assemblies being tested in accordance with ASTM E283 to meet or exceed the following requirements:
- C. Rate of leakage of the door assembly shall not exceed 0.3 cfm per square foot of door area for nonresidential swinging single doors, and 1.0 cfm per square foot of door area for nonresidential swinging double doors.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Inspect doors, frames, and accessories delivered to the site for damage. Unload and store with a minimum of handling. During delivery, strap door frames of welded unit construction together in pairs with the head of one frame inverted for bracing. Replace doors and frames damaged during delivery.
- B. Provide a bottom spreader bar tack welded to frames to maintain jamb alignment until frames are installed.
- C. Storage: Store doors and frames carefully on platforms under cover in dry and accessible locations, which are adequately ventilated and free from dust or water

and which permit easy access for inspection and handling. Avoid the use of non-vented plastic or canvas shelters that create a humidity chamber.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable manufacturers include Forderer Hollow Metal Products; Republic; Steelcraft; or equal.

2.02 MANUFACTURED UNITS

- A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated.
- B. Insulated Doors – Core Construction:
 - 1. Foamed in place polyurethane and steel reinforced core with no stiffener face welds.
 - 2. Provide 18-gauge steel vertical reinforcements 6 inches apart and welded in place. Foamed in place polyurethane core is chemically bonded to all interior surfaces. No face welding is permitted.
 - 3. Thermal properties to rate at a fully operable minimum U-Factor and R-Value (including insulated door and thermal-break frame) as shown on Drawings.
- C. Frames, Galvanized:
 - 1. Fabricate from hot dipped galvanized sheet steel meeting ASTM A653 G90.
 - 2. Minimum zinc coating: 0.90 total both sides ounces per square foot of metal surface.
 - 3. Metal thickness: 0.067 in. or heavier where noted.
- D. Doors, Galvanized:
 - 1. Fabricate face sheets and edge channels from hot dipped galvanized steel sheet meeting ASTM A653 G90 or A1008 commercial class 1.25.
 - 2. Minimum Zinc Coating: 1.25 ounces per square foot of metal surface.
 - 3. Metal Thickness: 0.053 in. or heavier where noted.
- E. Jamb Anchors:
 - 1. Provide the number of anchors required by the fire rating but not less than the following number for each jamb.
 - a. Frames up to 7'-6" high, three anchors.
 - b. Frames 7'-6" to 8'-0" high, four anchors.
 - c. Frames over 8'-0" high, four anchors plus one additional anchor for each 2 feet or fraction thereof above 8 feet.
 - d. Provide head anchors at 2-foot centers for openings wider than 3 feet.
 - 2. Frames in Masonry Walls: Provide adjustable tee strap, jamb anchors. Metal thickness: 0.053 in. minimum.
 - 3. Provide special anchors when specified or detailed.
- F. Floor Anchors: 0.053 in. minimum thickness, welded to frame at each jamb or mullion, punch for two 3/8-inch-diameter anchor bolts. Additional jamb anchors do not waive the requirement for floor anchors.

2.03 FABRICATION

- A. General: Fabricate in the shop. Accurately fit all work and fabricate in a manner to produce smooth, even surfaces free from warp, wave, buckle and other defects. Make square corners and angles unless shown otherwise on the Drawings. Set members in proper alignment, with edges straight and clean. Make provisions for hardware at locations in accordance with prevailing accepted standards, and as shown on the Drawings.
- B. Preparation for Hardware: Make to hardware templates and physical hardware. Locate center of panic hardware pushbars, door knobs, and lever handles 38 inches above the floor. Locations shall be coordinated between frames and doors, as shown on the Drawings, and all applicable accessibility and other code requirements. Make cutouts as required for intrusion alarm switches where scheduled. Punch stops of all frames for silencers, three in latching stop for single doors, two in head of double door frames.
- C. Frames: Fully welded, seamless construction with no visible seams or joints, strong, rigid and constructed so as not to bind, sag, twist or otherwise fail in use. Provide frames with throat opening dimension required to meet field requirements regardless of throat size shown.
 - 1. Frame members: Form each frame member from one piece of sheet steel.
 - 2. Joints: Miter corner joints, including integral stops, reinforce and weld continuously full length of joint. Fit other joints neatly and weld continuously full length of joint.
 - 3. Jamb anchors: Weld to inside jamb.
 - 4. Floor anchors: Weld to bottom of door frame jambs.
 - 5. Spreaders: Connect removable steel channel spreader ties across bottoms of welded door frames to hold rigid during shipping and until they are secured in place in the work.
 - 6. Hardware reinforcing: Weld in place, comply with NAAMM HMMA 867-16 standards. Shop drill and tap for template hardware. Field-drill and tap for surface mounted hardware.
 - a. Templates: Obtain from finish hardware manufacturer.
 - b. Hinges: 7-gauge steel, 1-1/4 inches wide by not less than 10 inches long. Prepare for full mortise hinges.
 - c. Strikes: 12-gauge steel, 1-1/2 inches wide with minimum lap of 2 inches beyond cutout.
 - d. Closers: 12-gauge steel, length to accommodate closer. Provide reinforcing at two locations on each frame for installation of either regular or parallel arm closers, whether or not closers are scheduled.
 - e. Plaster guards: 24-gauge steel, provide at strike and hinge reinforcing.
 - f. Flush bolts: 12-gauge steel.
 - 7. At exterior locations and where noted, provide shop welded 0.053 inch galvanized steel rain hood at head of door frame.
- D. Doors:
 - 1. Type: SDI Type III, extra heavy duty, fully welded style 2 full flush hollow steel construction for interior doors and exterior doors. Doors shall have no visible joints or seams on exposed faces and vertical edges.
 - 2. Top and bottom rails: 0.053 inch channel; fully flush design, continuous welded to face sheets.

3. Face sheet (or face panel) reinforcing shall meet the requirements of ANSI A151.1 for twist strength. The following methods are acceptable:
 - a. Continuous vertical stiffeners of not lighter than 0.026 inch steel, spaced not to exceed 6 inches on centers and spot welded to both face sheets at intervals not greater than 6 inches. Fill all voids with insulation.
 - b. An inner grid system consisting of vertical and horizontal members of not lighter than 0.042 inch steel, welded or interlocked for maximum strength and spaced not to exceed an average of 12 inches in either direction, and spot welded to both face sheets at intervals not greater than 6 inches. Fill all voids with insulation.
 - c. A continuous formed sheet steel truss core, full height and width, spot welded to face sheet at intervals not greater than 6 inches in both directions. Fill all voids with insulation.
 - d. Doors required to have a maximum temperature rise on the protected side shall have insulating cores as required to achieve the specified performance.
 4. Edge profile: Bevel vertical edges of stiles 1/8-inch in 2 inches.
 5. Door thickness: 1-3/4 inches or thicker as noted.
 6. Clearances: 3/32-inch clearance at jambs and head and 3/8-inch clearance at bottom; 1/4-inch clear between door and threshold where threshold occurs. Provide required clearance between door and stop to accommodate smoke gasket.
 7. Exterior doors: Provide a watertight flush closing channel at the top edge. Provide weep holes in the bottom closure to permit escape of entrapped moisture.
 8. Moldings for glass lights: 0.053 inch steel, drilled for countersunk screws.
 - a. Exterior doors: Weld moldings watertight, provide removable molding on inside face of door.
 9. Door cutouts: Cut outs for door openings shall be spaced at least the distance away from door edges or recesses for hardware that is required to maintain door fire rating and guarantee. All cut outs shall be made in the shop fabricating the doors.
 10. Hardware reinforcing: Comply with NAAMM HMMA 867-16 Standards. Shop drill and tap for template hardware. For surface mounted hardware, drill and tap in the field.
 - a. Hinge: 0.167 inch
 - b. Lockset: 0.093 inch
 - c. Flush bolt: 0.093 inch
 - d. Closer: 0.152 inch
 11. Provide reinforcement for closers both sides of all interior doors whether closers are scheduled or not.
- E. Astragals: Provide 1/8-inch-thick flat plate astragal welded to active leaf of paired doors unless other type of astragal is called out.

2.04 FINISHES

- A. Refer to Section 09 91 00 for surface preparation, pretreatment, primers, and application techniques.
- B. Apply one shop coat of rust inhibiting primer to all ferrous metal not scheduled to be galvanized.

- C. Galvanized work is to be prepared, field prime coated, and finish coated under Section 09 91 00. DO NOT SHOP-PRIME GALVANIZED WORK.

2.05 GALVANIZING REPAIR

- A. Repair damaged galvanizing by heated substrate repair method. Repair materials shall be Galv Bar as manufactured by US Alloy Company; or Gal-Viz as manufactured by The Harris Products Group; or equal.
 - 1. Heat substrate to 600°F, or apply hot process touch-up material right after welding before metal has cooled below 600°F.
 - 2. Rub bar of specified galvanize repair material over surface of hot substrate to apply a uniform coating of zinc. Wire brush hot coating with a clean wire brush to smooth out and bond zinc coating to substrate.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Frames: Set accurately in position, plumbed, aligned and braced securely until permanent anchors are set. Anchor bottom of frames securely to floors. Secure wall anchors to adjoining construction as indicated or required.
- B. Hanging Doors: Set accurately, snug against all stops and free from hinge bind. If shimming is required use sheet brass shims. Install hardware, weatherstripping, and smoke-tight gaskets. Adjust closing and latching speed of door closers for smooth operation, self-closing and automatic positive latching. Fasten with matching machine screws or bolts at all points where fasteners are indicated or required. Leave hardware in perfect working order. Clean and polish.
- C. Remove locksets, latchsets, and kickplates for field painting of doors. Replace hardware after painting work is completed.
- D. Repair damaged galvanizing by the heated substrate repair method using galvanized touch-up material specified in Part 2 of this Section.

END OF SECTION

SECTION 08 71 00

FINISH HARDWARE

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Furnish and install all finish hardware.
 - 2. Coordination, preparation, and installation of Finish Hardware by a certified Architectural Hardware Consultant (AHC).

1.02 REFERENCES

- A. American National Standards Institute (ANSI) and Builders Hardware Manufacturer's Association (BHMA):
 - 1. A156.1 Butts and Hinges
 - 2. A156.2 Bored and Preassembled Locks and Latches
 - 3. A156.3 Exit Devices
 - 4. A156.4 Door Controls-Closers
 - 5. A156.5 Auxiliary Locks and Associated Products
 - 6. A156.6 Architectural Door Trim
 - 7. A156.7 Template Hinge Dimensions.
 - 8. A156.8 Door Controls-Overhead Holders
 - 9. A156.13 Mortise Locks and Latches
 - 10. A156.15 Closer Holder Release Devices
 - 11. A156.16 Auxiliary Hardware
 - 12. A156.18 Materials and Finishes
- B. Americans with Disabilities Act (ADA):
 - 1. 2010 ADA Standards for Accessible Design
- C. ANSI/BHMA: Product standards for all specified items.
- D. Door and Hardware Institute (DHI):
 - 1. Basic Architectural Hardware.
 - 2. Abbreviations and Symbols.
- E. Underwriters Laboratories Inc.:
 - 1. UL 305 Panic Hardware
 - 2. UL 1784 Standard for Air Leakage Tests of Door Assemblies and Other Opening Protectives

1.03 SUBMITTALS

- A. Product Data: Fully describe every product proposed for use. Clearly identify substitutions or changes as a result of coordinating hardware components.
- B. Shop Drawings: Submit hardware list and schedule prepared by a certified Architectural Hardware Consultant in accordance with DHI recommendations. Organize the hardware list and schedule in the same order as the Door Hardware Schedule at the end of Part 3 of this specification section. Include the following information:
 - 1. Type, style, function, size, label, hand, and finish of each door hardware item.
 - 2. Manufacturer of each item.

3. Fastenings and other pertinent information.
 4. Location of each door hardware set, cross-referenced to the Door Hardware Schedule.
 5. Explanation of abbreviations, symbols, and codes used in the schedule.
 6. Mounting locations for door hardware. Manufacturer's Instructions: For mounting, installing and adjusting hardware.
- C. Door Hardware Schedule: Prepared by or under the supervision of Installer, detailing fabrication and assembly of door hardware, as well as installation procedures and diagrams. Coordinate final door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.
 - D. Keying Schedule: Contact City's representative for information regarding City's keyway system. Prepared under the supervision of the City, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. City to approve submitted keying schedule prior to the ordering of permanent cylinders.
 - E. Warranties: Submit special warranties as specified in this Section.
 - F. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions for the City's continued adjustment, maintenance, removal and replacement of door hardware, for each type of door hardware to include in maintenance manuals.
 - G. Product Test Reports: For compliance with accessibility requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for door hardware on doors located in accessible routes. Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.
 - H. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Contract Closeout. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service representatives. Include final hardware and keying schedule. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

1.04 QUALITY ASSURANCE

- A. Hardware Supplier:
 1. Engaged in supplying builder's hardware for projects of comparable size and shape for at least 5 years.
 2. Has a full-time certified Architectural Hardware Consultant (AHC) on staff who will prepare the hardware submittal and supervise installation of all finish hardware.
 - a. Architectural Hardware Consultant (AHC) Qualifications: A person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and who is currently certified by DHI as follows:
 - 1) For door hardware, an Architectural Openings Consultant (AOC).

- B. Perform Work in accordance with the following requirements:
 - 1. ANSI/BHMA A156 Series
 - 2. NFPA 80 and NFPA 105
 - 3. UL 305 and UL 1784
- C. Regulatory Requirements:
 - 1. 2022 California Building Code, especially Chapter 10 and Chapter 11.
 - 2. 2010 American with Disability Act (ADA) disabled access and use requirements for doors and doorways; 2010 ADA Standards for Accessible Design including without limitation to California Building Code Chapters 11A and 11B.
- D. Source Limitations: Obtain each type and variety of Door Hardware specified from a single source, qualified supplier unless otherwise indicated.

1.05 SPECIAL WARRANTY

- A. Door Hardware:
 - 1. Structural failures including excessive deflection, cracking, or breakage.
 - 2. Faulty operation of doors and door hardware.
 - 3. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.
 - 4. Electrical component defects and failures within the systems operation.
- B. Standard Warranty Period: One year from date of Substantial Completion, unless otherwise indicated.
 - 1. Mortise Locks and Latches: Ten years
 - 2. Exit Devices: Five years.
 - 3. Manual Closer: Ten years.

1.06 MAINTENANCE SERVICE

- A. Maintenance and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for City's continued adjustment, maintenance, and removal and replacement of door hardware.

1.07 DELIVERY

- A. Deliver hardware with items for each opening packed together, complete and ready for installation with necessary fittings, trim, fasteners and accessories. Mark packages with opening number for identification.
- B. Deliver permanent keys, cylinders, cores, and related accessories directly to City via registered mail or overnight package service. Deliver templates and installation instructions.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide hardware that complies with applicable fire and building codes. Provide all hardware, smoke gaskets and thresholds listed for a fire assembly of the required rating for all doors required to be fire rated.

- B. Accessibility Requirements: For door hardware on doors in an accessible route, comply with the 2010 ADA Standards for Accessible Design
 - 1. Provide operating devices that do not require tight grasping, pinching, or twisting of the wrist and that operate with a force of not more than 5 lbs.
 - 2. Bevel raised thresholds with a slope of not more than 1:2. Provide thresholds not more than 1/2 inch high.
 - 3. Adjust door closer sweep periods so that, from an open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the leading edge of the door.
- C. Provide hardware that fits perfectly, is of uniform color, and is free of imperfections affecting serviceability or marring appearance.
- D. Deliver hardware in a timely manner as required by the Contractor's Schedule. Furnish materials or templates to others when required for factory installation or preparation.
- E. Provide adequate functioning hardware for all doors whether scheduled or not. See paragraph 3.02B of this Section.
- F. Where the hardware manufacturer's product number specified does not provide hardware meeting fire codes, condition of use, function, hand, mounting conditions, strikes, stops, keepers or fasteners required for a satisfactory installation, provide items of equivalent or better quality, meeting applicable project conditions.
- G. Coordinate with the work of other trades in furnishing and placing finish hardware.

2.02 HARDWARE

- A. Fasteners: Furnish all necessary screws, bolts or other fastenings of suitable size and type to anchor the hardware in position for heavy use and long life; provide fasteners that match the material and finish of the hardware. Where necessary provide expansion shields, sex bolts, screws, or other anchors appropriate for substrate that the hardware is installed on. Provide machine screws and soft metal expansion shields to fasten hardware to concrete, masonry, plaster and similar materials. Plastic or fiber inserts are not acceptable.
- B. Finish: Provide all hardware with the following finish: US32D (630) satin stainless steel.
- C. Locksets:
 - 1. Mortise Locksets: BHMA A156.13 Heavy duty, with 6 pin cylinder with interchangeable core matching City's system. Schlage "L" Series; Corbin 9700 Series; or equal. Provide lever handles (lever shall be curved with a return to within 1/2 of the door), Design: Schlage 03; Corbin ML2000 Series; or equal.
 - 2. Backset: 2-3/4 inches.
 - 3. Strikes: Furnish standard strikes with curved lip extended to protect trim from being marred by latch bolt. Provide dust boxes. Verify whether standard or ANSI cutouts are provided in metal frames.
- D. Keys and Keying
 - 1. All keyed locksets and padlocks shall be supplied with interchangeable core cylinders to match the City's interchangeable core and keying system.
 - 2. All cylinders shall be supplied with temporary construction cores for Contractor's use. Permanent cores shall be delivered directly to the City's Representative.

3. Tag keys with location, and schedule heading number and deliver them to City upon completion of work. Deliver permanent keys directly to City.
 4. Furnish construction keying. Provide construction master keyed cylinders or temporary keyed construction cores. Provide construction master keys in quantity as required by project Contractor. Replace construction cores with permanent cores. Deliver two (2) extra keys directly to the City's Representative. Retain construction keys and cores for future lockout purposes.
- E. Hinges: Butts, Full Mortised. Conform to ANSI/BHMA A156.1. Provide heavy weight, 5 knuckle ball bearing stainless steel butts for interior doors and heavy weight 5 knuckle stainless steel ball bearing butts for exterior doors.
1. Stanley FBB168 for interior doors, Stanley FBB199 for exterior doors, McKinney, or equal.
 2. Provide non-removable pins for all exterior outswinging doors.
 3. Unless otherwise specified, determine the size of the butts by the following table:
 - a. Doors 1 ¾ inch thick and up to 42 inch wide to have 4 ½ inch.
 4. Provide widths sufficient to clear trim projection when door swings 180 degrees.
 5. Provide three (3) hinges to 90 inch high for each door leaf
- F. Closers: Provide heavy-duty door closers of one manufacturer; non-handed double arm, with metal covers full rack and pinion type ANSI/BHMA A156.4 Grade 1 with steel spring and non-gumming, non-freezing hydraulic fluid; non-sized adjustable for exterior doors to 4 feet wide (cylinder sizes 1 through 6).
1. Provide controls for regulating closing, latching speeds and back check non-handed double arm. Provide all closers with a cushion stop built into closer arm that can be adjusted to stop door opening at a pre-set angle. Provide closers designed with spring power adjustment required for easy opening usable by the physically disabled; 8.5 pounds for exterior doors.
 2. Provide parallel-arm closers at reverse bevel doors and where doors swing full 180 degrees.
 3. Include all through bolts, mounting brackets, mounting plates, shoes, and accessories required for proper function and installation.
 4. Furnish hold open arms when specified. Provide maximum degree of opening attainable consistent with closer function specified.
 - a. Provide factory painted finish consisting of: Special Rust Inhibiting (SRI) pre-treatment, followed by a powder coat painted finish that exceeds 100-hour salt spray test, ANSI Standard A156.4 and ASTM B117 on metal cover, arm, and fasteners.
 - b. Acceptable Manufacturers:
 - 1) LCN 4111 Series or equal.
- G. Doorstop/Holder, Floor- Mounted: Provide a strike with a hinged hook that fits flush with the strike when unit is acting as a stop only. The hook is manually lifted to engage the hold-open lug. When released, the hook drops back flush with the strike. Provide in stainless steel or solid brass finished or plated to match hardware. Note: UL requirements do not permit hold-open feature on fire-rated door assemblies.
- H. Thresholds: Furnish white or yellow bronze thresholds to match other door hardware unless noted otherwise. Anodized aluminum is not acceptable.

- I. Weatherstripping: Provide door seal at all exterior doors: 3/16 inch by 3/8 inch closed-cell PVC with adhesive back tape. Pemko 241, Reese, or equal.
- J. Manual Flush Bolts: Provide concealed manual top and bottom flush bolts on the inactive leaf of pairs of doors. Provide bolts designed to be mounted in the edge of the door with concealed vertical rod activators, having a 5/8-inch throw and a 7/8-inch adjustment and a spring snap lever action. Glynn-Johnson #FB-5 for aluminum doors; #FB-6 for metal doors; and #FB-6W for wood doors.
- K. Mortised Drop Bottom: Fully mortised, plunger activated, automatic drop bottom, extruded tempered aluminum, clear anodized finish, grey sponge neoprene inserts, stainless steel fasteners suitable for hollow metal doors. Pemko 434PKL, Reese, or equal.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General: Contractor is responsible for the proper location, fit and operation of all finish hardware items under the appropriate headings. Install finish hardware according to the Drawings, Specifications and finish hardware manufacturer's instruction. Place and adjust stops and or shim hinges to provide clearance for smoketight gaskets and to prevent doors from binding on stops or frames.
 - 1. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.
 - 2. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after unsatisfactory conditions have been corrected and such discrepancies or conflicts have been resolved in writing.
- B. Install each item of mechanical equipment to comply with manufacturer's written instructions and according to specifications. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing. Do not install surface-mounted items until finishes have been completed on substrates involved.
- C. Make the right-hand door or right-hand reverse door the active leaf of a pair of doors unless indicated otherwise.
- D. Mounting Heights: Mount door hardware at the following heights unless specifically indicated otherwise on the Drawings.
 - 1. Locksets and latchsets: 38 inches above maximum finish floor to center of lever.
 - 2. Deadbolts: Not more than 44 inches above finish floor to operating trim.
 - 3. Exit Devices: 40 inches above finish floor to center of touch bar.
- E. Fitting: Properly cut, drill, shape, reinforce and otherwise fabricate items upon which finish hardware is to be installed according to templates, physical hardware and finish hardware manufacturer's instructions to insure proper attachment and function.

- F. Key Control System: Tag keys and place them on markers and hooks in key control system cabinet, as determined by final keying schedule.
- G. Adjustment: Install all lock cylinders to accept keys with the teeth facing up. Adjust, shim, align all hardware to operate smoothly without binding or rubbing and so that self-closing and automatic closing doors will latch automatically.
- H. Doorstops/Holders:
 - 1. Where physical conditions do not permit installation of the specified doorstop, holder or keeper without creating a tripping hazard, provide a suitable item of comparable quality that will perform the intended function and can be installed such as a wall-mounted or surface overhead door-mounted device.
 - 2. Locate doorstops, holders and keepers so doors will be held open in the maximum open position.
 - 3. For all outswinging pairs of doors that have cane, surface or flush bolts and do not have overhead door holders, provide exterior keepers to receive the cane, surface or flush bolts to hold doors open in the maximum open position.
- I. Defective Installation: Appearance, installation, attachment and operation of finish hardware shall be subject to review by the Engineer. Replace finish hardware found unacceptable as directed.

3.02 ADJUSTING

- A. Adjust and check each operating item of door hardware and each door to ensure proper operation and function of every hardware component. Replace hardware components that cannot be adjusted to operate as intended.
- B. Adjust door closers to compensate for building pressures and operation of forced air mechanical equipment to comply with accessibility requirements.
- C. Initial adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.
 - 1. Spring Hinges: Adjust to achieve positive latching when door is allowed to close freely from an open position of 30 degrees.
 - 2. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.
- D. Occupancy Adjustment: Approximately six months after date of Substantial Completion, Installer's Architectural Hardware Consultant shall examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.
- E. Defective Installation: Appearance, installation, attachment, and operation of finish hardware shall be subject to review by the City. Hardware that is scratched, broken, dirty, improperly painted, binds or fails to function shall be replaced.

3.03 CLEANING AND PROTECTION

- A. Clean adjacent surfaces soiled by door hardware installation. Clean hardware components as necessary to restore proper finish.
- B. Provide protection during subsequent work progress to maintain conditions that ensure door hardware is in perfect working order and without damage or deterioration at the time of Substantial Completion.

3.04 HARDWARE SCHEDULE

- A. The Contractor is responsible for providing all finish hardware together with all components, accessories and fasteners necessary for a complete and smooth operating installation.
- B. The door hardware sets represent the design intent and direction of the City and Architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the Architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.
- C. The supplier is responsible for handing and sizing all products as listed in the door hardware sets. Quantities listed are for each pair of doors, or for each single door.
- D. Only one manufacturer per product may be used on the project.
- E. Items in the following hardware schedule are referenced by catalog number to the first named manufacturer.

Item	1 st Manufacturer	2 nd Manufacturer
Butts, hinges	Stanley	Hager, or equal
Locksets, latches Cylinders, padlocks	Schlage	Corbin Russwin, or equal
Closers	LCN	Sargent, or equal
Silencers, stops, holders	Glynn-Johnson	Builder's Brass, or equal
Automatic flush bolts, Flush bolts, strikes	Ives, Glynn-Johnson	Builder's Brass, or equal
Automatic door bottoms	Pemko	Reese, or equal
Thresholds	Pemko	Reese, or equal
Cane bolts, foot bolts	Richards-Wilcox	Stanley, or equal

- F. Schedule of Hardware Groups:
 - 1. Hardware Group 1
 - All pairs of doors shall have:
 - 3 Pair Butt Hinges
 - 1 Lockset, Active Leaf, ANSI Function F20
 - 2 Manual Flush Bolts, Inactive leaf
 - 1 Dustproof Strike
 - 2 Door Bottoms
 - 2 Door Stop/Holders
 - 2 Sets Weatherstripping
 - 1 Aluminum Threshold

END OF SECTION

SECTION 08 91 00

LOUVERS

PART 1 - GENERAL

1.01 SUMMARY

Section Includes:

- A. Fixed Blade Acoustic Louvers.

1.02 REFERENCES

- A. Air Movement and Control Association International, Inc. (AMCA)
 - 1. AMCA 500-L Laboratory Methods of Testing Louvers for Rating
 - 2. Standard 501 Louver Application Manual and Design Guide
 - 3. AMCA 511 Certified Ratings Program - Product Rating Manual for Air Control Devices.
- B. ASTM International (ASTM):
 - 1. B221 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
 - 2. D1187 Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal
 - 3. E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements
 - 4. E413 Classification for Rating Sound Insulation
- C. "Architectural Sheet Metal Standards" by Sheet Metal and Air Conditioning Contractors National Association (SMACNA), latest edition.
- D. California Building Standards Commission
 - 1. 2022 California Building Code (CBC) (California Code of Regulations, Title 24)
- E. Fenestration & Glazing Industry Alliance (FGIA):
 - 1. AAMA 611 Voluntary Specification for Anodized Architectural Aluminum

1.03 SUBMITTALS

- A. Product Data: Manufacturer's data sheets for each product and assembly specified.
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Cleaning methods.
- B. Shop Drawings: Custom prepared for this project.
 - 1. Include plans; elevations; sections; and details showing profiles, angles, and spacing of elements. Show unit dimensions related to wall openings and adjacent construction; free area for each size indicated for louvers; profiles of frames at jambs, heads, and sills; and anchorage details and locations.
 - 2. Verify openings by field measurements before fabrication and indicate measurements on Shop Drawings.

- C. Product Certificates:
1. Air Performance: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500 and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
 2. Water Penetration: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500 and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
 3. Weather Louver Effectiveness: Certificates signed by Air Movement and Control Association International Inc (AMCA) certifying that the manufacturer's stock units are tested in accordance with AMCA Standard 500-L99, Section 8.3.2 - Wind Driven Rain Water Penetration Test, and are licensed to bear the AMCA Certified Ratings Seal in accordance with AMCA Standard 511.
- D. Selection Samples: Two complete color charts showing the full range of colors available for units with factory-applied color finishes.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 5-year manufacturing similar products.
- B. Installer Qualifications: Minimum 2-year experience installing similar louvers.
- C. Source Limitations: Obtain products through one source from a single manufacturer where alike in one or more respects regarding type, design, or factory-applied color finish.
- D. AMCA Standard 500-L: Air performance, water penetration and air leakage ratings shall be determined in accordance with Air Movement and Control Association International Inc (AMCA) Standard 500, "Laboratory Methods of Testing Louvers for Rating."
- E. SMACNA Standard: Comply with SMACNA's "Architectural Sheet Metal Manual" recommendations for fabrication, construction details, and installation procedures.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations, and industry standards.
- B. Store products indoors in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer. Protect from damage.
- C. Handling: Protect materials and finishes during handling and installation to prevent damage.

1.06 SEQUENCING AND SCHEDULING

- A. Field Measurements: Verify openings and adjacent construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.01 GENERAL REQUIREMENTS FOR STATIONARY AND ACOUSTIC LOUVERS.

- A. Provide louvers that have all joints concealed.
- B. Continuously weld all joints in the louver assembly using a shielded arc process.
- C. Provide all related break shape and extruded aluminum sills, flashings and sub-frames. Flashings shall be 0.050 inch or thicker as indicated.
- D. Provide matching 1/8-inch thick dark bronze anodized aluminum backing plates to cover the rear of decorative louvers and portions of louvers outside of air intake or exhaust ductwork.
- E. Provide all required aluminum angles, tees, plates and other shapes required for a complete installation.

2.03 ACOUSTIC LOUVERS

- A. Model: T9106 as manufactured by Airolite; Construction Specialties; Ruskin; or equal.
- B. Design Criteria: Louvers shall be acoustic type incorporating stationary, parallelogram blades in a single frame. Louvers shall be 8-inches deep and assembled entirely from fabricated aluminum components. Drainable blades and louver frames shall be 0.080-inch thick aluminum, alloy 5052-H32. Blades shall be positioned at 45-degrees and spaced 5-inches on center. Each blade and top and bottom frame cavity shall be filled with fiberglass acoustic insulation to absorb the transmission of sound. Acoustic insulation shall be held in place by perforated aluminum panels. Acoustic insulation to be protected by a woven fire-retardant (self-extinguishing) 100% polyester sheeting. Fasteners to be aluminum or stainless steel. Structural supports shall be designed and furnished by the louver manufacturer to carry a wind load of 25 psf.
- C. Louver Size: As shown on Drawings.
- D. Performance Data:
 - 1. Based on testing 48-inch x 48-inch size unit in accordance with AMCA 500-L.
 - 2. Free Area: 25 percent, nominal.
 - 3. Minimum Free Area Size: 4.07 square feet.
- E. Minimum Air Performance and Water Penetration
 - 1. Penetration Ratings Standard: Air Movement and Control Association (AMCA) Certified Ratings Seals for air performance and water penetration ratings.
 - 2. Air Performance and Water Penetration Data: A 4' x 4' unit provides 4.07 square feet of free area and shall intake 1,046 FPM free area velocity at a static pressure drop not exceeding 0.13" H₂O per AMCA Standard 500-L.
- F. Acoustic Performance: Tested in accordance with ASTM E 90 and E413.
 - 1. Acoustic Ratings Data: Octave Band Center Frequency (Hz) - Free Field Noise Reduction in Decibels; 63 Hz-16 dB; 125 Hz- 13dB; 250 Hz-15dB; 500 Hz-18 dB; 1,000 Hz-16dB; 2,000 Hz-18dB; 4,000 Hz-18 dB; and 8,000 Hz-21dB

2.02 ALUMINUM FINISHES

- A. Anodized Louvers: Comply with AAMA's "Voluntary Specification for Anodized Architectural Aluminum" for requirements of high performance aluminum oxide coatings and finish designations.
- B. Finish units after assembly.
- C. Class I, Color Anodic Finish: AA-M12C22A42/A44 complying with AAMA 611.
 - 1. Mechanical Finish: Nonspecular as fabricated.
 - 2. Chemical Finish: Etched, medium matte.
 - 3. Anodic Coating: Architectural Class I, integrally colored or electrolytically deposited color coating 0.018 mm or thicker. Color to fall in standard range for color variation in anodic finishes.

2.03 LOUVER SCREENS

- A. General: Provide exterior louvers with louver screens.
 - 1. Screen Location for Adjustable Louvers: Interior face, unless otherwise indicated.
 - 2. Screening Type: Insect screening, unless otherwise indicated.
 - 3. Where ductwork is attached to the interior side of louver provide holder for screen frame that can be built into ductwork and so arranged that by opening a door in duct, screen can be slid out for cleaning without disassembling ductwork. Where there is no ductwork attached to interior of louver, provide a holder for screen frame designed so that screen can be removed for cleaning and replaced without using tools.
- B. Attachment: Secure screens to louver frames with stainless-steel machine screws, spaced 18 inches on center.
 - 1. Louver Screen Frames: As manufactured by The Airolite Co; to sizes indicated on Drawings.
 - 2. Fabrication: Mitered corners.
 - 3. Metal: Roll formed aluminum.
 - 4. Finish: Mill finish, unless otherwise indicated.
 - 5. Type: Rewirable frames with a driven spline or insert for securing screen mesh.
- C. Louver Screening for Aluminum Louvers: As manufactured by The Airolite Co.
 - 1. Insect Screening: Aluminum, 18-by-16 mesh, 0.012-inch wire.

2.04 BITUMINOUS PAINT

- A. Bituminous Paint: Cold-applied asphalt mastic complying with SSPC-Paint 12 but containing no asbestos fibers, or cold-applied asphalt emulsion complying with ASTM D 1187.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Protect all aluminum in contact with concrete, plaster, masonry, steel or galvanized metal with a coating of bituminous paint. Prepare substrates and openings using methods recommended by manufacturer for achieving best result for substrates under project conditions.

- B. Install louvers as shown on the Contract Drawings and as shown in the SMACNA Architectural Sheet Metal manual.
 - 1. Locate and place units level, plumb, and at indicated alignment with adjacent work.
 - 2. Use concealed anchorages where possible. Provide brass or lead washers fitted to screws where required to protect metal surfaces and to make a weathertight connection.
 - 3. Provide perimeter reveals and openings of uniform width for sealants and joint fillers as indicated on Drawings.
 - 4. Repair finishes damaged by cutting, welding, soldering, and grinding. Restore finishes so no evidence remains of corrective work. Return items that cannot be refinished in the field to the factory, make required alterations, and refinish entire unit or provide new units.
- C. Provide insect screens on all louvers. Install on the interior side. Use stainless steel screws throughout.
- D. Install sill flashing as shown detailed and as required to provide a watertight installation.
- E. Install sheet metal drip at head of louvers where shown.
- F. Apply sealant type "B" all around frame, inside and outside in accordance with the requirements of Section 07 92 00. Install concealed gaskets, flashings, joint fillers, and insulation, as installation progresses, where weathertight joints are required.

3.02 ADJUSTING, CLEANING AND PROTECTION

- A. Test operation of adjustable louvers and adjust as needed to produce fully functioning units that comply with requirements.
- B. Protect products from damage until completion of project. Use temporary protective coverings where needed and approved by manufacturer. Remove protective covering at the time of Substantial Completion.

END OF SECTION

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SECTION 09 91 00

PAINTING

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. A painter's finish on all exterior and interior surfaces, except:
 - a. Integrally finished materials such as concrete masonry units, concrete floors, etc.
 - b. Factory finished items such as anodized aluminum, light fixtures, etc.
2. Painter's top coat or refinishing coat in a color to match adjacent surfaces on:
 - a. Miscellaneous mechanical and electrical items that are furnished with a factory finish that does not match the color of surrounding surfaces such as panelboards, air supply or return registers, fire extinguisher brackets, and similar items that are located on finished walls or ceilings.
3. Back prime woodwork prior to installation.
4. Prime coat paint all exposed and concealed surfaces of sheetmetal flashings prior to installation. See also Section 07 62 00.

1.02 REFERENCES

- ###### A.
- Where standards of surface preparation are described by citing SSPC specification numbers, reference is made to "Systems and Specifications" Volume 2 published by the Society for Protective Coatings, at SSPC.org.

1.03 SUBMITTALS

- ###### A. Contractor Qualifications:
- Submit a list of at least five projects completed in the past five years where High-Performance Coatings, similar to those required for this project, were applied by the Specialty Painting Contractor proposed for this project.
- ###### B. Product Data:
1. Submit complete technical data on all materials to be used on the project for review prior to ordering material. Include manufacturer's brand name and type of material for each coat of each system to be used.
 2. The Contractor shall base his bid on using the products specified. If the products specified are not available in formulations that meet applicable Air Quality Management District regulations on maximum VOC levels, the Contractor shall submit products of equivalent quality and function that comply with regulations in effect at that time.
 3. If products manufactured by makers other than the first named product by the first named maker listed in Part 2 of this Section are submitted, submit supporting performance test results prepared by an independent paint testing laboratory for comparison with the performance of the first named product by the first named maker.
 4. If the Contractor's second submittal of a proposed equivalent material is not favorably reviewed the Contractor will be back-charged by the City for the cost of subsequent reviews.

- C. Manufacturer's Certification: That products furnished meet applicable Air Quality Management District regulations as to allowable VOC content for the place of application and use intended.
- D. Samples: For paints submit two 8 1/2 by 11-inch brush-outs of each paint system and each color on cardboard.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: All work, material, procedures and practices under this Section shall conform with requirements of the Federal Standard 40 CFR on air quality control, and the requirements of the local Air Resources Board or Air Quality Management District having jurisdiction. Coatings or primers applied at locations other than the project site shall be done in accordance with local air quality regulations in effect at the place the coating is applied.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver all materials in unopened containers with manufacturer's label. Label shall state VOC content.
- B. Store in assigned area. Maintain storage area clean and fire safe. Dispose of used rags and clean buckets daily. Store solvents in closed approved storage containers.
- C. Submerge solvent soaked rags in water.

1.06 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Provide ambient temperatures recommended by manufacturer of material to be applied.
 - 2. Provide adequate ventilation.
 - 3. Provide 40- to 50-foot candles of illumination on all surfaces in areas to be painted including floors, walls and ceiling that may not require painting.
 - 4. Use temporary dust barriers to close off areas being painted from areas where other work is being performed.

1.07 COLORS AND COLOR SAMPLES

- A. Before starting work, obtain color schedule and samples of colors selected for this project by the City. "Deep tone" highly pigmented accent colors may be selected for up to 10% of the area painted.
- B. Colors are to be factory or machine mixed, using light-fast colorants proportioned by accurate measurement into a proper tinting base. The color formula for each color shall be submitted to facilitate future color matching.
- C. Exterior deep tone colors are to be factory ground into the pigment for maximum color fastness.

PART 2 - PRODUCTS

2.01 MATERIALS – GENERAL

- A. Coatings used shall be "top of the line" and of the type recommended by the manufacturer for the intended use and substrate.

- B. Applicable Air Quality Management District regulations prohibit the manufacture, sale or application of Architectural Coatings and Specialty Coatings having greater than stipulated levels of volatile organic compounds.
- C. If the Contractor applies any coatings for which it has not submitted certificates indicating the VOC content and that the product complies with applicable Air Quality Management District regulations, or if it applies coatings that have been modified or thinned other than as recommended by the manufacturer, the Contractor shall be responsible for any fines, costs, remedies, or legal actions that may result.
- D. The Contractor shall not submit or use any material containing Trichlorethylene III because of its potential cancer-causing properties. If any of the materials specified in this Section contain trichlorethylene, they shall be considered deleted from this Specification.

2.02 SPECIALTY COATINGS: PRIMERS, STAINS, SEALERS, AND CLEARS

- A. Products and makers listed establish type of material and level of quality. Equivalent products manufactured by Glidden Professional Paints, Sherwin-Williams, or equal may be submitted for review.
- B. Specialty Coatings: Coatings listed under this category include primers, sealers, stains and clear coatings. All products provided shall comply with the maximum allowable VOC limit assigned to that category of product by the Air Quality Management District having jurisdiction.
 - 1. LATEX UNIVERSAL RUST INHIBITING PRIMER
Primer for galvanized metal, shop primed steel, etc. Glidden Professional Acrylic Enamel Devflex 4020PF, Sherwin-Williams Pro Industrial Pro-Cryl Universal Acrylic Primer B66W01310, or equal.
 - 2. ALKYD RUST INHIBITING PRIMER
Solvent thinned, oxide red primer Glidden Devguard 4160, Sherwin-Williams Kem Kromik Universal Metal Primer B50WZ1, or equal.
 - 3. ALKYD PHENOLIC GALVANIZED METAL PRIMER
Solvent thinned, alkyd phenolic galvanized metal primer. XIM 360 Gray NT Primer, Tnemec-Zinc Series 90-97, Glidden Devguard 4160, Sherwin-Williams Sherwin Williams DTM Acrylic Primer/Finish, or equal.
 - 4. ALKYD EXTERIOR WOOD PRIMER
Sherwin-Williams Exterior Latex Wood Primer B42W08041, Glidden Gripper Interior/Exterior Primer Sealer 3210-1200 (W), 3210-1300 (G); or equal.

2.03 ARCHITECTURAL COATINGS

- A. Coatings listed under this category consist of decorative and protective coatings used to protect surfaces and provide color for buildings and other structures. Most paints and enamels fall under this category.
- B. Products and makers listed establish type of material and level of quality. Equivalent products manufactured by Glidden, Sherwin-Williams, Devoe Coatings, Olympic, or equal may be submitted for review.
 - 1. HIGH GLOSS EXTERIOR LATEX ENAMEL
100% acrylic latex exterior enamel with excellent color and gloss retention and excellent weather resistance. Devoe Coatings Interior/Exterior Waterborne Acrylic Gloss Enamel Devflex No. 4208QD, Sherwin-Williams SuperPaint Exterior Acrylic Latex High Gloss A85 Series Paint, or equal.

2. SEMI-GLOSS EXTERIOR LATEX ENAMEL
100% acrylic latex (medium gloss) exterior house and trim enamel with excellent color and gloss retention and weather resistance. Glidden Premium Exterior Semi-Gloss Paint, Sherwin-Williams SuperPaint Exterior Latex Gloss A84 Series, or equal.
3. SEMI-GLOSS ACRYLIC LATEX INTERIOR ENAMEL
Sherwin-Williams ProClassic® Interior Acrylic Latex Enamel Series, Glidden Diamond™ Interior Latex Semi-Gloss, or equal.
4. HIGH GLOSS INDUSTRIAL ENAMEL
Sherwin-Williams Industrial Enamel B54 Series, Devco Coatings Devguard 4308, or equal.

PART 3 - EXECUTION

3.01 CONDITION OF SURFACES TO BE PAINTED

- A. Examine areas to receive work of this Section. Make certain that surfaces are even, smooth, sound, clean, dry, and free from defects or substances that might affect application.
- B. Arrange for repairs or major cleaning as required. Starting work indicates acceptance of surfaces as satisfactory to achieve required result.

3.02 PREPARATION OF SURFACES

- A. Check that hardware, trim, plates, lighting fixtures and similar items have been removed before starting work; coordinate with work under sections installing such items. Check that equipment adjacent to walls shall be disconnected and moved to permit wall surfaces to be painted before starting work under this Section.
- B. Wash metal surfaces with solvent or cleaner to remove dirt or grease, and clean off rust or scale with wire brush or sandpaper.
- C. Bare or Shop Coated Steel: Remove rust and scale by wire brushing or sandblasting; wash with solvent or cleaner.
- D. Galvanized Steel: Etch with phosphoric solution such as Watco "Galvaprime", Endura "Galva-prep", or equal; flush surface clean with water and allow to dry.
- E. Prepare all surfaces in accordance with the more stringent of the coating material manufacturer's recommendations, other requirements in this paragraph 3.02 or referenced or applicable requirements for surface preparation in "Systems and Specifications", Volume 2, published by The Coatings Society, at SSPC.org and summarized below:
 1. SSPC-SP1 - Solvent Cleaning: Removal of all oil, grease, soil, drawing compound, cutting compound and other soluble contaminants from the surfaces with solvents and/or commercial cleaners by wiping, dipping, steam cleaning or vapor degreasing.
 2. SSPC-SP2 - Hand Tool Cleaning: Removal of all loose mill scale, rust, paint, and other loose detrimental foreign matter by the use of non-powered hand tools.
 3. SSPC-SP3 - Power Tool Cleaning: Removal of all loose mill scale, rust, paint, and other loose detrimental foreign matter by the use of power-operated portable tools.

4. SSPC- SP6 - Commercial Blast Cleaning: Removal of all oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products and other foreign matter by compressed air nozzle blasting, centrifugal wheels or other required methods. Remaining discoloration stains shall not exceed 33-1/3% of each square inch of surface.
 5. SSPC-SP7 - Brush-Off Blast Cleaning: Removal of all oil, grease, dirt, dust, loose-mill scale and loose paint by compressed air nozzle blasting. Centrifugal wheels or other required means.
 6. SSPC-SP11 – Power Tool Cleaning to Bare Metal: Removal of all stains from mill scale, rust or paint using power tools to take a surface to bare metal, while ensuring a minimum surface profile of 1 mil. Used in situations where abrasive blasting is not possible or feasible.
 7. SSPC-SP13 – Surface Preparation of Concrete: Preparation of concrete surfaces prior to the application of bonded coating or lining systems by the removal of all surface contaminants including laitance, loose concrete and dust. Standard covers requirements for thermal, mechanical and chemical application methods.
- F. Interior Woodwork, Painted Finish: Hand sand with 150-grit aluminum oxide paper to remove all tool marks and scratches; dust clean. Seal knots and pitch pockets with knot sealer. Fill nail holes and cracks after first coat. Sand work between coats with 180-grit paper.
- G. Exterior Woodwork: Remove all tool marks and splinters. Sand with 150-grit sandpaper. Seal pitch pockets and knots.
- H. Dust all surfaces and wipe clean with a tack rag just prior to coating.

3.03 APPLICATION

- A. Apply all material in strict accordance with manufacturer's instructions. Apply first coat immediately after surface preparation.
- B. Do not apply coatings when temperature is below 55°F. Do not apply exterior coatings in damp or rainy weather. Do not apply exterior coatings on damp wood.
- C. Brush out each coat to a uniform, even coating; lay material on in one direction and brush out at right angles. Special application techniques may be required for new coatings with low VOC content. Apply such coatings in strict accordance with manufacturer's detailed instructions. Allow material to dry 48 hours between coats unless longer period specified by manufacturer.
- D. Do necessary puttying or filling of nail holes, cracks and other blemishes prior to applying the first coat. Finish putty or fill flush with adjoining surface in neat, workmanlike manner. Putty or fill nail holes in wood to be stained, with colored putty to match finish. Verify after first coat, for any additional puttying or filling of nail holes, cracks and other blemishes that were missed prior to the first coat application.
- E. Back prime all interior and exterior wood trim before installation. Prime all exposed and concealed surfaces of sheetmetal flashing prior to installation.
- F. Paint items and surfaces before installation that will be difficult or impossible to paint after installation.
- G. Coat all six surfaces of wood doors with the specified coats. Seal mortises and cutouts for locks, hinges and other hardware with varnish.

- H. Apply not less than the number of coats specified. Apply additional coats if required for uniform coverage and full hiding. Apply finishes in their factory original consistencies. Do not thin unless specifically recommended by the manufacturer.
- I. Finish work shall be uniform in color, full coverage, smooth and free of sags and brush marks. Varnish work shall be done so that an entire surface is coated while maintaining a wet edge so that there are no lap marks or areas of uneven color.
- J. Do all cutting in to a sharp, true line. Repaint if necessary to correct over runs.
- K. Do not paint over Underwriters' labels, fusible links, sprinkler heads, or fire alarm devices.
- L. Paint access panels, electrical panels, air registers and similar items prior to installation to prevent edges from peeling or chipping when panels are removed.
- M. Repaint factory finished electrical panels, air registers, and other items to match adjacent painted surfaces.

3.04 PROTECTION, CLEANING AND COMPLETION

- A. Protect finish work by suitable covering or other method as job progresses.
- B. Remove paint or varnish spots from floors, glass and other surfaces, upon completion of work. Remove rubbish, empty containers and other accumulated materials from premises. Leave work in clean, orderly, acceptable condition.
- C. Check work of this Section at completion of project. Touch-up or refinish marred or damaged surfaces. Replace glass damaged by operations under this Section. Leave entire area with finish free from imperfections.

3.05 PAINTING SYSTEMS AND SCHEDULE: ARCHITECTURAL COATING SYSTEMS

- A. See Finish Schedule or notes on Drawings for location of surfaces to receive paint systems.
- B. Characteristics of paint materials are described in Part 2 of this Section. First-named products are listed in this Schedule. Equivalent products by other manufacturers may be submitted for review in accordance with paragraphs 1.03 and 2.02 of this Section.
- C. System "A": EXTERIOR/INTERIOR HIGH-GLOSS LATEX ENAMEL
 - 1. First Coat:
 - a. Shop primed ferrous metal: Touch-up with ALKYD RUST INHIBITING PRIMER. Devco Coatings Multi-Purpose Tank and Structural Primer Devguard No. 4160.
 - b. Or, where shop prime coat is not suitable for overcoating with latex systems, re-prime entire surface with ALKYD PHENOLIC PRIMER. Devco Coatings All Purpose Metal and Galvanized Primer Devguard No. 4160.
 - c. Unprimed ferrous metal: ALKYD RUST INHIBITING PRIMER.
 - d. Galvanized Metal: Pretreat with phosphate solution and prime with ALKYD PHENOLIC GALVANIZED METAL PRIMER. XIM 360 Gray NT Primer.
 - e. Wood: ALKYD EXTERIOR WOOD PRIMER. Sherwin-Williams Exterior Latex Wood Primer B42W08041.

2. Second and Third Coats:
 - a. Two coats of HIGH GLOSS EXTERIOR LATEX ENAMEL. Devoe Coatings Interior-Exterior Waterborne Acrylic Gloss Enamel, Devflex No. 4208QD.
- D. System "B": EXTERIOR/INTERIOR SEMI-GLOSS LATEX ENAMEL.
1. First Coat:
 - a. Shop primed ferrous metal: Touch-up with ALKYD RUST INHIBITING PRIMER. Devoe Coatings Multi-Purpose Tank and Structural Primer Devguard No. 4160. Where shop prime coat is not suitable for overcoating with latex system, re-prime entire surface with ALKYD PHENOLIC PRIMER. Devoe Coatings Multi-Purpose Tank and Structural Primer Devguard No. 4160.
 - b. Unprimed ferrous metal: ALKYD RUST INHIBITING PRIMER. Devoe Coatings Multi-Purpose Tank and Structural Primer Devguard No. 4160.
 - c. Galvanized Metal: Pretreat with phosphate solution in accordance with paragraph 3.02D and prime with ALKYD PHENOLIC GALVANIZED METAL PRIMER. XIM 360 Gray NT Primer.
 - d. Aluminum: Pretreat with metal etch and prime over aluminum. XIM 360 Gray NT Primer, Devoe Coatings Multi-Purpose Tank and Structural Primer Devguard No. 4160
 2. Second and Third Coats: Two coats of SEMI-GLOSS EXTERIOR LATEX ENAMEL Sherwin-Williams SuperPaint Exterior Latex Gloss A84 Series.
- E. System "C": SEMI-GLOSS ACRYLIC LATEX INTERIOR ENAMEL
1. First Coat:
 - a. On wood: Accu-Pro Interior Sandable Alkyd Enamel Undercoat.
 2. Second and Third Coats: SEMI-GLOSS ACRYLIC INTERIOR ENAMEL: Sherwin-Williams ProClassic® Interior Acrylic Latex Enamel Series
- F. System "D": HIGH GLOSS ALKYD INDUSTRIAL MAINTENANCE ENAMEL
1. Surface Preparation:
 - a. Steel: Brush-off blast cleaning to create a fine tooth. SSPC-SP7 or SSPC-SP6.
 - b. Galvanized Metal: Solvent cleaning followed by pretreatment with phosphate solution. See paragraph 3.02D in this Section.
 2. First Coat:
 - a. Steel: ALKYD RUST INHIBITING PRIMER (touch up shop primed work). XIM 360 Gray NT Primer, Devoe Coatings Multi-Purpose Tank and Structural Primer Devguard No. 4180.
 - b. Galvanized Steel: ALKYD PHENOLIC GALVANIZED METAL PRIMER.
 - c. Aluminum: CHROMATE METAL PRIMER. XIM 360 Gray NT Primer, Devoe Coatings Multi-Purpose Tank and Structural Primer Devguard No. 4160.
 3. Second and Third Coats: HIGH GLOSS ALKYD INDUSTRIAL ENAMEL applied at a surface dry film thickness of 6 mils per coat. Sherwin-Williams Pro Industrial Urethane Alkyd Enamel, Devoe Coatings Interior/Exterior Alkyd Gloss Enamel, Speed enamel No. 4318, or equal.

Electric Conduit Specifications

1. 26 05 33 – Junction Boxes
2. 26 05 42 - Conduit

SECTION 260533

OUTLET, JUNCTION AND PULL BOXES

PART 1 - GENERAL

1.01 Description of Work:

- A. The work of this Section consists of providing all required labor, supervision, materials and equipment to satisfactorily complete all electrical installations shown on the drawings, included in these Specification, or otherwise needed for a complete and fully operating facility. The work shall include but not be limited to the following:
- B. Furnish and install all required material, supports and miscellaneous material for the satisfactory interconnection of all associated electrical systems.

1.02 Related Work:

- A. See the following specification sections for work related to the work of this section.
 - 2. 260542 Conduits, Raceway and Fittings.

PART 2 - PRODUCTS

2.01 Outlet boxes, Junction and Pull boxes

- A. Standard Outlet Boxes: Galvanized, steel, knock-out type of size and configuration best suited to the application indicated on the Drawings. Minimum box size shall be 4 inches square (octagon for most light fixtures) by 1-1/2 inches deep with mud rings as required.
- B. Switch boxes: Minimum box size shall be 4 inches square by 1-1/2 inches deep with mud rings as required. Install multiple switches in standard gang boxes with raised device covers suitable for the application indicated.
- C. Conduit bodies: Cadmium plated, cast iron alloy. Conduit bodies with threaded conduit hubs and neoprene gasketed, cast iron covers. Bodies shall be used to facilitate pulling of conductors or to make changes in conduit direction only. Splices are not permitted in conduit bodies. Crouse-Hinds Form 8 Condulets, Appleton Form 35 Unilets or equal.
- D. Sheet Metal Boxes: Use standard outlet or concrete ring boxes wherever possible; otherwise use a minimum 16 gauge galvanized sheet metal, NEMA I box sized to Code requirements with covers secured by cadmium plated machine screws located six inches on centers. Circle AW Products, Hoffman Engineering Company or equal.
- E. Flush Mounted Pull boxes and Junction boxes: Provide overlapping covers with flush head cover retaining screws, prime coated.

PART 3 - EXECUTION

3.01 Outlet Boxes

- A. General:
 - 1. All outlet boxes shall finish flush with building walls, ceilings and floors except in mechanical and electrical rooms above accessible ceiling or where exposed work is called for on the Drawings.

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OUTLET, JUNCTION AND PULL BOXES

2. Install raised device covers (plaster rings) on all switch and receptacle outlet boxes installed in masonry or stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.
3. Leave no unused openings in any box. Install close-up plugs as required to seal openings.

B. Box Layout:

1. Outlet boxes shall be installed at the locations and elevations shown on the drawings or specified herein. Make adjustments to locations as required by structural conditions and to suit coordination requirements of other trades.
2. Locate switch outlet boxes on the latch side of doorways.
3. Outlet boxes shall not be installed back to back nor shall through-wall boxes be permitted. Outlet boxes on opposite sides of a common wall shall be separated horizontally by at least one stud or vertical structural member.
4. For outlets mounted above counters, benches or backsplashes, coordinate location and mounting heights with built-in units. Adjust mounting height to agree with required location for equipment served.
5. On fire rated walls, the total face area of the outlet boxes shall not exceed 100 square inches per 100 square feet of wall area.

C. Supports:

1. Outlet Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Fixture outlet boxes installed in suspended ceiling of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.
3. Fixture outlet boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above where pendant mounted lighting fixture are to be installed on the box.
4. Fixture Boxes above tile ceilings having exposed suspension systems shall be supported directly from the structure above.
5. Outlet and / or junction boxes shall not be supported by grid or fixture hanger wires at any locations.

3.02 Junction And Pull Boxes

A. General:

1. Install junction or pull boxes where required to limit bends in conduit runs to not more than 360 degrees or where pulling tension achieved would exceed the maximum allowable for the cable to be installed. Note that these boxes are not shown on the Drawings.

SECTION 260533

OUTLET, JUNCTION AND PULL BOXES

2. Locate pull boxes and junction boxes in concealed locations above accessible ceilings or exposed in electrical rooms, utility rooms or storage areas.
3. Install raised covers (plaster rings) on boxes in stud walls or in furred, suspended or exposed concrete ceilings. Covers shall be of a depth to suit the wall or ceiling finish.
4. Leave no unused openings in any box. Install close-up plugs as required to seal openings.
5. Identify circuit numbers and panel on cover of junction box with black marker pen.

B. Box Layouts:

1. Boxes above hung ceilings having concealed suspension systems shall be located adjacent to openings for removable recessed lighting fixtures.

C. Supports:

1. Boxes installed in metal stud walls shall be equipped with brackets designed for attaching directly to the studs or shall be mounted on specified box supports.
2. Boxes installed in suspended ceilings of gypsum board or lath and plaster construction shall be mounted to 16 gauge metal channel bars attached to main ceiling runners.
3. Boxes installed in suspended ceilings supporting acoustical tiles or panels shall be supported directly from the structure above.
4. Boxes mounted above suspended acoustical tile ceilings having exposed suspension systems shall be supported directly from the structure above.

END OF SECTION

SECTION 260542

CONDUITS, RACEWAYS AND FITTINGS

PART 1 - GENERAL

1.01 Description of Work:

- A. The Payment includes the work of this section consists of furnishing and installing conduits, raceways and fittings as shown on the Drawings and as described herein.

1.02 Related Work:

- A. See the following specification sections for work related to the work in this section:
 - 1. 260519 Line Voltage Wire and Cable
 - 2. 260533 Junction and Pull Boxes

PART 2 - PRODUCTS

2.01 Conduits, Raceways:

- A. Electrical Metallic Tubing (EMT) shall be hot-dip galvanized after fabrication. Couplings shall be compression or set-screw type.
- B. Flexible Conduit: Flexible metal conduit shall be galvanized steel.
- C. Galvanized Rigid Steel Conduit (GRS) shall be hot-dip galvanized after fabrication. Couplings shall be threaded type.

2.02 Conduit Supports:

- A. Supports for individual conduits shall be galvanized malleable iron one-hole type with conduit back spacer.
- B. Supports for multiple conduits shall be hot-dipped galvanized Unistrut or Superstrut channels, or approved equal. All associated hardware shall be hot-dip galvanized.
- C. Supports for EMT conduits shall be galvanized pressed steel single hole straps.
- D. Clamp fasteners shall be by wedge anchors. Shot in anchors shall not be allowed.

2.03 Fittings:

- A. Provide threaded-type couplings and connectors for rigid steel conduits; provide steel compression (watertight), or steel set-screw type for EMT, (die-cast zinc or malleable iron type fittings are not allowed). Provide threaded couplings and Meyers hubs for rigid steel conduit exposed to weather.
- B. Fittings for flexible conduit shall be Appleton, Chicago, IL, Type ST, O-Z Gedney Series 4Q by General Signal Corp., Terryville, CT, T & B 5300 series, or approved equal.
- C. Fittings for use with rigid steel shall be galvanized steel or galvanized cast ferrous metal; access fittings shall have gasketed cast covers and be Crouse Hinds Condulets, Syracuse, NY, Appleton Unilets, Chicago, IL, or approved equal. Provide threaded-type couplings and connectors; set-screw type and compression-type are not acceptable.

SECTION 260542

CONDUITS, RACEWAYS AND FITTINGS

- D. Fittings for use with rigid non-metallic conduit shall be PVC and have solvent-weld-type conduit connections.
- E. Union couplings for conduits shall be the Erickson type and shall be Appleton, Chicago, IL, Type EC, O-Z Gedney 3-piece Series 4 by General Signal Corp., Terryville, CT, or approved equal. Threadless coupling shall not be used.
- F. Bushings:
 - 1. Bushings shall be the insulated type.
 - 2. Bushings for rigid steel shall be insulated grounding type, O-Z Gedney Type HBLG, Appleton Type GIB, or approved equal.
- G. Conduit Sealants:
 - 1. Fire Retardant Types: Fire stop material shall be reusable, non-toxic, asbestos-free, expanding, putty type material with a 3-hour rating in accordance with UL Classification 35L4 or as specified on the Drawings.

PART 3 - EXECUTION

3.01 Conduit, Raceway and Fitting Installation:

- A. For conduit runs exposed to weather provide rigid metal (GRS).
- B. For conduit runs concealed in steel or wood framed walls or in ceiling spaces or exposed in interior spaces above six feet over the finished floor, install EMT.
- C. Flexible metal conduit shall be used only for the connection of recessed lighting fixtures and motor connections unless otherwise noted on the Drawings. Liquid-tight steel flexible conduit shall be used for motor connections.
- D. The minimum size raceway shall be 3/4-inch unless indicated otherwise on the Drawings.
- E. Installation shall comply with the CEC.
- F. From pull point to pull point, the sum of the angles of all of the bends and offset shall not exceed 360 degrees.
- G. Conduit Supports: Properly support all conduits as required by the NEC. Run all conduits concealed except where otherwise shown on the drawings.
 - 1. Exposed Conduits: Support exposed conduits within three feet of any equipment or device and at intervals not exceeding NEC requirements; wherever possible, group conduits together and support on common supports. Support exposed conduits fastened to the surface of the concrete structure by one-hole clamps, or with channels. Use conduit spacers with one-hole clamps.
 - a. Conduits attached to walls or columns shall be as unobtrusive as possible and shall avoid windows. Run all exposed conduits parallel or at right angles to building lines.
 - b. Group exposed conduits together. Arrange such conduits uniformly and neatly.

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CONDUITS, RACEWAYS AND FITTINGS

2. Support all conduits within three feet of any junction box, coupling, bend or fixture.
 3. Support conduit risers in shafts with Unistrut Superstrut, or approved equal, channels and straps.
- H. Moisture Seals: Provide in accordance with NEC paragraphs 230-8 and 300-5(g).
- I. Provide a nylon pull cord in each empty raceway.
- J. Provide galvanized rigid steel factory fittings for galvanized rigid steel conduit.
- K. Conduits shall be blown out and swabbed prior to pulling wires, or installation of pull cord in empty conduits.

END OF SECTION

Ornamental Fencing and Gate Operator

1. 32 31 19 – Ornamental Fencing

Ornamental Fencing System

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Civil Drawings
- B. Drawings, general provisions of Contract Agreement Form including Appendices and Exhibits, Division 1 Specification Sections, and California Building Code, Title 24, Part 2 and appropriate sections for educational facilities apply to this Section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. Ornamental Fencing

1.3 PAYMENT

- A. Ornamental Fencing: The linear foot price shall include the cost to cover all fencing, posts fittings, footings, cantilever gate, electric slide gate operator, swing gate, and appurtenances for the proposed ornamental fence and slide gate along the Scotts Valley Drive frontage as set forth in the Contract Documents.

1.4 PERFORMANCE REQUIREMENTS

- A. Fence Style: Ameristar Aegis II – Invincible Style or approved substitute.
- B. Fence Color: Black
- C. Electric Slide Gate Operator: Doorking 9100 or approved substitute

1.5 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Warranty: All fence components (rails, pickets and posts) shall be warranted by the manufacture for a minimum period of 10 years from the date of purchase Warranty shall cover defects in material finish, including cracking, peeling, chipping blistering or corroding.

1.6 QUALITY ASSURANCE

- A. Fencing shall meet adhesion per ASTM D3359 – Method B for retention coating.
- B. Fencing shall meet corrosion resistance per ASTM B117, D714 & D1654.

SECTION 32 31 19

Ornamental Fencing System

- C. Fencing shall meet impact resistance per ASTM D2794.
- D. Fencing shall be weather resistant per ASTM D822, D2233 & D 523 (60" <

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Once the product has arrived to the job site, verify all materials have not been damaged during shipping or handling.
- B. Protect Fencing from dirt and damage weather until installation occurs.

PART 2 - MATERIALS

2.1 MANUFACTURERS

- A. Available Manufacturers: Ameristar Aegis II – Invincible Style or approved substitute.
- B. Electric Slide Gate Operator: Doorking 9100 ½ HP or approved substitute.

2.2 MATERIALS

- A. Steel material for fencing framework (pickets, rails and posts) shall be galvanized prior to forming in accordance with the requirements of: ASTM A653/A543M with maximum yield strength of 45,000 psi. The steel shall be hot-dip galvanized to meet the requirements of ASTM A 653/A653M with minimum zinc coating weight of 0.90 oz/ft².
- B. Fence picket material shall be 1" square x 14 Ga. Tubing. Picket retaining rods shall be 0.125" diameter galvanized steel. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.
- C. Gate Operator shall be made of steel frame for strength and quiet operations with a polypropylene cover for durability.

2.3 FABRICATION

- A. Picket, Rails and post shall be precut to specified lengths. Fore Runner rails shall be prepunched to accept pickets. Pickets shall be predrilled to accept retaining rods.
- B. The manufactured galvanized framework shall be subjected to a thermal stratification coating process including a pretreatment/wash, an electrostatic spray application of a epoxy base, a separate electrostatic spray application of a polyester finish. The base coat shall be a epoxy powder coating followed by a top coat with a minimum thickness of 2 mils (0.0508 mm).
- C. Completed sections (Panels) shall be capable of supporting 600 lbs load applied at mid-span without deformation of a ¼ inch.

SECTION 32 31 19

Ornamental Fencing System

2.4 FENCE POST CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
 - 1. Cement: ASTM C150, Type 11.
 - 2. Minimum 2,500 psi - Fence Post Compression Strength
 - 3. Fine Aggregate: ASTM C33, sand.
 - 4. Coarse Aggregate: ASTM C33, crushed gravel.
 - 5. Water: Potable.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 31 23 00 – “Excavation and Fill.”

3.2 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of ornamental fencing. Location and arrangement of fencing layout take into account many design considerations. Install fencing as indicated, to extent practical.
- B. Posts shall be set in concrete and post footing shall have a minimum depth of 36-inches.
- C. If fence cutting is to occur, all exposed steel shall be sealed. Sealing shall consist of the following items:
 - 1. Remove all shavings;
 - 2. Apply zinc-rich primer to cover edges and let dry;
 - 3. Apply two coats of matching paint.
- D. Install necessary gate railing, rollers, wheels and other necessary appurtenances per the manufactures recommendations for the swing and cantilevered gate entrance.
- E. Install electric gate operator per manufacturer requirements and coordination with cantilever rolling gate.

3.3 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as the work progresses. Maintain gate operation as follows:
 - 1. Cantilever gate can be pushed open and closed by a District staff member prior to electrical gate operator being put into service.
 - 2. Swing gate can be pushed open and can stay in a neutral position once fully opened.
 - 3. Swing gate can be pushed open and closed by a District staff member for daily site visits that do not require a truck to use the electric cantilever gate entrance.

END OF SECTION

Landscaping Specifications

1. 32 74 00 – Planting Bio-Retention Area
2. 32 84 00 – Planting Irrigation
3. 32 90 00 - Planting

PART 1 - GENERAL

1.01 SUMMARY

- A. This section describes work consisting of the sourcing and installation of bioretention soil mix, drainage gravel, perforated underdrain, liner, and associated features of the constructed vegetated bioretention facility.

1.02 REFERENCES

- A. Central Coast Regional Water Board – Soil Requirements
- B. Bay Area Stormwater Management Agencies Association (BASMAA)

1.03 SUBMITTALS

- A. Submit the following information:
 - 1. Reports of results of required tests by an independent, accredited laboratory demonstrating material conformance to requirements.
 - 2. In addition, for compost, submit the following:
 - a. Sufficient data and test results demonstrating conformance with the specification requirements (2.01 Media – A).
 - b. A list of the feedstock by percentage present in the final compost product.
 - c. A copy of the producer's current STA certification as issued by the U.S. Composting Council.
 - 3. The following information about the testing laboratory(ies):
 - a. Name of laboratory(ies) including contact information.
 - b. Qualifications of laboratory and personnel including date of current certification by STA, ASTM, AASHTO, or equal.
 - 4. The name and contact information of all suppliers of material under this Section.

1.04 PAYMENT

- A. The bidder shall include in his proposal a sum to cover all soil media, installation, and perforated pipe as set forth in the Contract Documents.

1.05 QUALITY ASSURANCE

- A. Source Quality Control: Test import materials proposed for use to demonstrate that the materials conform to the specified requirements. Tests shall be performed and in accordance with 1.04 B (d).
- B. Field Quality Control:
 - 1. The Engineer will:
 - a. Review materials proposed for use.
 - b. Review results of independent testing laboratory tests.
 - c. Review the final graded bioretention facility prior to placement of any material.
 - d. Review all delivered filtration system media and materials prior to placement.
 - e. Review media after mixing.
- C. All bioretention soil media shall be thoroughly mixed to a homogenous consistency before placement.

- D. For every 50 cubic yards of media to be installed, a falling head test shall be performed on a representative media sample. The final media installed shall be from the same batch as the representative sample tested. The falling head tests shall be completed by an independent laboratory or engineer and results submitted for review. The minimum adjusted infiltration rate:

1. 5 in/hr

1.06 DELIVERY, STORAGE AND HANDLING

- A. Protect all materials from damage during delivery. Storage surfaces should be free from dirt, mud and debris.
- B. Media shall be stored separately from each other and all other materials.
- C. All media shall be protected from all sources of additional moisture, in covered conveyance at the site until incorporated into the work.

PART 2 - PRODUCTS

2.01 MEDIA

- A. Bioretention Soil Media (BSM)
1. BSM shall consist of 30 to 40 percent compost by volume and 60 to 70 percent sand by volume. The mixture shall be well blended to produce a homogeneous mix.
 2. Sand shall conform to the requirements specified in paragraph 2.01B of this Section.
 3. Compost shall conform to the requirements specified in paragraph 2.01C of this Section.
 4. BSM shall have organic matter content between 5 and 9 percent. Organic content test shall be performed in accordance with Testing Methods for the Examination of Compost and Composting (TMECC) 05.07A, "Loss-On-Ignition Organic Matter Method".
 5. Minimum adjusted infiltration rate of 5in/hr.
- B. Sand (for use in Bioretention Soil Media)
1. Sand shall be free of organic matter, waste, coating, or any other deleterious material.
 2. Comply with the requirements of ASTM C33.
- C. Compost (for use in Biofiltration Soil Mix)
1. Compost products shall be the result of the biological degradation of feedstocks as specified below, under controlled conditions designated to promote aerobic decomposition.
 2. Compost shall be stable with regard to oxygen consumption and carbon dioxide generation.
 3. Compost shall be mature with regard to its stability for serving as a soil amendment as defined below.
 4. The compost shall have a moisture content that has no visible free water or dust produced when handling the material.
 5. Compost material shall be tested in accordance with the U.S. Composting Council "Testing Methods for the Examination of Compost and Composting"

SECTION 32 74 00
STORMWATER BIORETENTION FACILITY

(TMECC) Test Method 02.02-B, "Sample Sieving for Aggregate Size Classification", to meet the size gradations established in the U.S. Composting Council's "Seal of Testing Assurance" (STA) program, as follows. Fine compost shall meet the following gradation by dry weight:

Percent Passing 2"	Minimum of 100%
Percent Passing 1"	99 – 100%
Percent Passing 5/8"	90 – 100%
Percent Passing 1/4"	75 – 100%

- a. The pH shall be between 6.0 and 8.5 when tested in accordance with TMECC 04-11-A, "1:5 Slurry pH".
 - b. Manufactured inert material (plastic, concrete, ceramics, metal, etc.) shall be less than 1.0% by weight as determined by TMECC 03.08-A "percent dry weight basis".
 - c. Minimum organic matter content shall be 40 percent by dry weight basis as determined by TMECC 05.07-A, "Loss-On-Ignition Organic Matter Method".
 - d. Soluble salt contents shall be less than 4.0 mmhos/cm tested in accordance with TMECC 04.10-A, "1:5 Slurry Method, Mass Basis".
 - e. Maturity shall be greater than 80% in accordance with TMECC 05.05-A, "Germination and Vigor".
 - f. Stability shall be 7 or below in accordance with TMECC 05.08-B, "Carbon Dioxide Evolution Rate".
 - g. The compost product must originate a minimum of 65 percent by volume from recycled plant waste. A maximum of 35 percent by volume of other approved organic waste, including post-consumer food waste, but not including biosolids, and animal waste, may be substituted for recycled plant waste. The supplier shall provide written verification of feedstock sources.
 - h. Fine Compost shall have a carbon to nitrogen ratio of less than 25:1 as determined using TMECC 04.01 "Total Carbon" and TMECC 04.02D "Total Kjeldhal Nitrogen".
6. The compost supplier shall test all compost products within 30 Calendar Days prior to installation. Samples shall be collected using the STA sample collection protocol. The sample collection protocol can be obtained from the U.S. Composting Council, 4250 Veterans Memorial Highway, Suite 275, Holbrook, NY 11741 Phone: 631-737-4931, www.compostingcouncil.org. The sample shall be sent to an independent STA Program approved laboratory. The compost supplier shall pay for the test. A copy of the approved independent STA Program laboratory test report shall be submitted to the Engineer prior to initial application of the compost. At least 14 Calendar Days prior to placement, a sample of each type of compost to be used shall be submitted to the Engineer.

2.02 DRAINAGE GRAVEL

- A. Caltrans Standard Specification Paragraph 68-2.02F(3) Class 2 Permeable Material.

2.03 PERFORATED UNDERDRAIN

- A. Polyvinyl Chloride (PVC) Pipe:
1. Pipe 6-inches in diameter and smaller
 - a. Type: Schedule 40 polyvinyl chloride (PVC), white, normal impact, Type 12454 B, ASTM D1784 and ASTM D1785.
 - b. Joints: Solvent weld.

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- c. Fittings: Solvent weld, socket type, of same material as the pipe, Schedule 40, ASTM D2467.
- d. Cement: Solvent weld, ASTM D2564, as recommended by the pipe manufacturer for the schedule and size to be joined.
- e. Pipe Cleaner: As recommended by the pipe manufacturer for the schedule and size to be joined.
- f. Provide perforated pipe for drainage where identified on the drawings.

2.04 LINER

- A. Material: A puncture- and UV-resistant composite consisting of a high-density polyethylene woven reinforced fabric coated on both sides with low-density polyethylene.
- B. Thickness: 30 mil
- C. Manufacturer: AquaArmor BTL-30 manufactured by BTL Liners

PART 3 - EXECUTION

3.01 MEDIA INSTALLATION

- A. Grading or placement of aggregates or bioretention media within the basins shall not begin until the area draining to the filtration basins has been stabilized and favorably reviewed by the Engineer.
- B. Runoff shall not be allowed to enter the filtration basins until completed and favorably reviewed by the Engineer, including landscaping. Prior to starting work, provide temporary re-routing of runoff directly to the existing storm drain system, or as otherwise submitted and favorably reviewed.
- C. Placement shall not occur if any of the media are wet. The Engineer will have final authority to determine if wet conditions exist.
- D. Mixing or placing bioretention media shall not be allowed if the area receiving bioretention media is wet or saturated or has been subjected to more than ½-inch of precipitation within 48-hours prior to mixing or placement. The Engineer will have final authority to determine if wet or saturated conditions exist.
- E. All bioretention media shall be thoroughly mixed to a homogenous consistency before placement.
- F. No heavy equipment shall operate within the bioretention facility perimeters once excavation has begun, including during excavation, placement of bioretention media, planting, or mulching of the facility.
- G. No materials or substances shall be mixed or placed within bioretention facility areas, other than the specified materials. Remove all construction debris prior to placement of materials.

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- H. Grading and retaining wall construction shall be completed to accommodate the placement of bioretention soil media and drainage gravel as shown on the Drawings.
- I. The subgrade shall be prepared and constructed in accordance with these Specifications and in conformity with the lines, grades, depth, and typical cross-section shown in the Drawings or as favorably reviewed by the Engineer.
 - 1. Provide a minimum square footage of level area identified on the Drawings.
 - 2. Elevation of level finished grade shall be as shown on the Drawings or otherwise favorably reviewed, to achieve a 12" ponding depth, and to ensure positive drainage from the surface of the parking lot, without ponding onto the parking lot surface or overflowing to other locations.
- J. Place liner on sides of bioretention facility adjacent to public rights-of-way (including both City of Scotts Valley and Caltrans) and structures.
- K. Place media in lifts to the minimum depth shown on the Drawings plus 3 inches to account for anticipated post-installation consolidation. Comply with the lift depth requirements shown on the drawings.
- L. All post-media placement shall be favorably reviewed by Engineer.
- M. All excess material shall be removed from the site and disposed of accordingly.

END OF SECTION

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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. Provide complete, automatically controlled, spray sprinkler, turf rotor, bubbler and/or drip underground irrigation system as shown on Drawings.
- B. Payment includes but is not limited to: excavating, backfilling, finish grading, piping, valves, sprinklers, specialties, controls, and wiring for automatic control irrigation system.
- C. Related Sections include the following:
 - 1. Specification Section 31 23 00 Excavation and Fill.
 - 2. Specification Section 32 90 00 Planting.

1.3 DEFINITIONS

- A. Lateral (Circuit) Piping: Downstream from control valves to sprinklers, rotors, emitters and specialties. Piping is under pressure during flow.
- B. Mainline Piping: Downstream from point of connection to water distribution piping to, and including, control valves. Piping is under water-distribution-system pressure.
- C. The following are industry abbreviations for plastic materials:

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1. ASME: American Society of Mechanical Engineers.
2. ASTM: American Society for Testing and Materials.
3. AWG-UF: American Wire Gauge - Underground Feeder
4. NFPA: National Fire Protection Association.
5. PSIG: Pounds per Square Inch Gauge.
6. PVC: Polyvinyl Chloride Plastic.
7. SDR: Standard Direct Ratio.
8. V: Volt

1.4 PERFORMANCE REQUIREMENTS

- A. Location of Sprinklers, Rotors, Emitters and Specialties: Design location is approximate. Make minor adjustments necessary to avoid plantings and obstructions such as signs and light standards. Maintain 100 percent, head to head, water coverage of turf and planting areas indicated with uniform coverage and minimum over-spray onto paving and no spray onto buildings and structures.
- B. Minimum Working Pressures: The following are minimum rated pressure requirements for piping, valves, and specialties, unless otherwise indicated:
 1. Irrigation Main Piping: 200 psig.
 2. Lateral (Circuit) Piping: 150 psig.
- C. Irrigation Schedule: In accordance with Title 24, Part 11 – Outdoor Water Use Requirements, Contractor shall prepare two (2) – three (3) irrigation schedules, one for plant establishment, one for the established landscape and one for temporarily irrigated areas if applicable. Each schedule shall indicate the number of gallons used and shall target the Estimated Total Water Use (ETWU) and not exceed the Maximum Applied Water Allowance (MAWA) calculated on the Irrigation Plan “California Water Efficient Landscape Worksheet.” Irrigation Schedule shall be submitted at substantial completion. After acceptance of substantial completion, Contractor shall laminate schedule in plastic and place in controller enclosure prior to final completion and end of maintenance. In preparing the Irrigation Schedule, the Contractor shall consider the following:

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1. Irrigation interval (days between irrigation).
2. Irrigation run times.
3. Number of cycle starts to avoid runoff.
4. Amount of applied water scheduled to be applied on a monthly basis.
5. Application rate setting.
6. Root depth setting.
7. Plant type setting.
8. Soil type.
9. Slope factor setting.
10. Shade factor setting.
11. Irrigation uniformity or efficiency setting.

1.5 SUBMITTALS

- A. Product and Project Data: With-in 14 days after award of the contract, furnish the Owner's Representative with submittal data on all items intended for installation. Substitute equipment or material installed without the approval of the Owner's Representative will be removed and replaced with specified items at this Contractor's expense. Submit manufacturer's technical data and installation instructions for irrigation components conforming to requirements of Division 1. Include pressure ratings, rated capacities, and settings of irrigation components. Submittal shall include the following:

1. Backflow device including cage and/or blanket.
2. Master control valve.
3. Flow Sensor(s).
4. Main, lateral (circuit) and sleeving pipe.
5. Pipe fittings, primer and cement.
6. Tracer wire and/or warning tape.
7. Isolation valves.
8. Remote control valves.
9. Valve boxes.
10. Sprinklers, rotors, bubblers, drip emitters.
11. Swing joints.

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12. Tree bubbler drain tubes.
 13. Controllers. Include wiring diagrams, enclosures and mounting methods.
 14. Control wires. Include splice kits and conduit.
 15. Valve identification tags.
 16. Irrigation Wiring Diagram: Contractor shall prepare and submit an irrigation wire diagram showing location of control wire, common wire, spare control wire and spare common wire with quantities noted at each run shown on copy of irrigation plan in a legible size and format.
 17. Irrigation installation firm qualifications in accordance with "quality assurance".
 18. Name and contact information of certified irrigation auditor performing the irrigation audit for this project.
- B. Coordination Drawings: During the course of construction, maintain orderly set of irrigation drawings and details on project site during installation of irrigation system. Record daily changes showing piping and major system components. Measure and neatly record dimensions for all mainlines, control wire runs, and all other pertinent information facilitating maintenance and extension of the irrigation system to within one (1) foot horizontally and six (6) inches vertically. Indicate interface and spatial relationship between piping, system components, adjacent utilities, and proximate structures. Up to date coordination drawings shall be available for review prior to meetings with the Owner's Representative.

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C. Submittals at Substantial Completion:

1. Irrigation Record Drawings. Contractor shall record information gathered on "Coordination Drawings" onto a clean set of Irrigation Plans for documentation of as-built conditions.
2. Controller Legend: Upon approval of record drawing submittal, prepare two (2) legible, reduced to 11" by 17" in size, non-fading, waterproof copies of the Record Irrigation Drawings, laminated between two (2) .020 mm (minimum) plastic sheets, printed on front side only. Attach one (1) copy to door of controller or enclosure and deliver one (1) copy to Owner. Plan sheet shall include the following information:
 - a. Installing Contractor's company name, phone number and address.
 - b. Color coded zone identification by valve.
 - c. Zone start time.
 - d. Zone water duration.
 - e. Type of planting irrigated.
 - f. Valve size, station numbers and controller designations.
3. Submit Irrigation Schedule for review and approval in accordance with Title 24, Part 1 at substantial completion. Once approved, laminate in plastic and place inside controller enclosure for final completion at end of maintenance period.
4. Irrigation System Leak Test Results.
5. Irrigation backflow preventer certification.
6. Central control installation certification.
7. Operation and Maintenance Data: For irrigation systems, to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 1 Section "Closeout Procedures," include data for the following:
 - a. Automatic-control valves.
 - b. Sprinklers, rotors and/or emitters.
 - c. Controllers.

1.6 QUALITY ASSURANCE

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A. Governing Agency Requirements:

1. For projects subject to review and approval by local governing agencies, Contractor shall comply with the State of California Model Water Efficient Landscape Ordinance at a minimum and shall conform to local codes and/or ordinances, whichever may be more stringent.

B. Installer Qualifications:

1. Experience: The irrigation installation firm shall have contracted for and successfully completed construction of a minimum of five (5) California public school district construction projects, approved by the Division of the State Architect (DSA), within the past five (5) years of similar size, complexity, budget and scope.
2. Licensure: The irrigation installation firm shall hold a current, active C27 "Landscaping Contractor" license classification by the California State License Board that has been consistently active for at least five (5) years and that has not been suspended or revoked.
3. Supervision: The irrigation installation firm shall have a qualified and experienced irrigation technician on site during irrigation installation.
4. Drip Irrigation: The irrigation installation firm shall have contracted for and successfully complete construction of a minimum of five (5) drip irrigation installations within the past five (5) years of similar size and complexity.

C. Manufacturer Qualifications: Provide underground irrigation system as a complete unit. Each type component produced by a single acceptable manufacturer, including heads, valves, controls and accessories.

D. 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.

E. Contractor shall provide all licenses, fees and other charges required for completion of the work.

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1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- B. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

1.8 PROJECT CONDITIONS

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

1.9 COORDINATION

- A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 3.

1.10 MAINTENANCE

- A. Irrigation maintenance shall coincide with planting maintenance, refer to Specification 32 90 00 "Planting". In the event planting is not part of this work, maintenance

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shall begin at written approval from Owner's Representative of substantial completion, run ninety (90) calendar days and until receipt of Owner's Representative's written acceptance of completion of punch list items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Use new materials of brands shown on Drawings, specified herein or approved equal.
- B. Use existing materials if shown on Drawings.
- C. Substitution of sprinklers, rotors, drip, valves and controllers will not be allowed due to variation in flows, precipitation rates, friction losses, and sizing and maintaining consistency with client equipment standards.

2.2 PIPES, TUBES, AND FITTINGS

- A. Above Grade Irrigation Mainline Piping: Steel Pipe: ASTM A 53/A 53M, Schedule 40, Type S or E, Grade A or B, galvanized with threaded ends.
 - 1. Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M or ASTM A 106, Schedule 40, galvanized, seamless steel pipe with threaded ends.
 - 2. Malleable-Iron Unions: ASME B16.39, Class 150, hexagonal-stock body with ball-and-socket, metal-to-metal, bronze seating surface, and female threaded ends.
 - 3. Gray-Iron Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.
 - 4. Cast-Iron Flanges: ASME B16.1, Class 125.
 - 5. Cast-Iron Flanged Fittings: ASME B16.1, Class 125, galvanized.
- B. Mainline Piping: (unless specified otherwise on Drawings):

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1. Class 200 (C900), gasketed, purple reclaimed water PVC pipe, ASTM D-2241, NSF approved (size 6" and larger).
2. Class 315 purple reclaimed water PVC pipe, ASTM D-2239, NSF approved (size 2-1/2" to 4").
3. Schedule 40 purple reclaimed water PVC pipe, ASTM D-1785, NSF approved (size 2" and smaller).
4. Fittings to be schedule 80 PVC.

C. Lateral Line Piping (unless specified otherwise on Drawings):

1. Schedule 40 purple reclaimed water PVC pipe, ASTM D 2466, NSF approved.
2. Fittings to be schedule 40 PVC.

D. Sleeves (unless specified otherwise on Drawings):

1. For irrigation piping, use schedule 40 purple PVC pipe, NSF approved, size and quantity as required for irrigation piping unless otherwise specified on drawings..
2. For irrigation wiring, use schedule 40 PVC pipe, UL listed, NEMA TC-6, ANSI/UL651, ASTM F512, for outdoor, direct bury applications, PVC, size and quantity as required, unless otherwise specified on Drawings.
3. Fittings to be schedule 40 PVC.

2.3 Valves:

A. BACKFLOW PREVENTION DEVICE:

1. As indicated on the Drawings.

B. ISOLATION VALVES:

1. As indicated on the drawings.

C. QUICK-COUPLING VALVES:

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1. As indicated on the drawings.

D. REMOTE CONTROL VALVES:

1. As indicated on the drawings.

E. VALVE BOXES:

1. In paved areas, use Christy or Carson concrete utility box, size as required.
2. In planting areas, use Carson plastic underground enclosure with locking lid, bolt and washer, size as required, color to be green for potable water and purple for non-potable water systems.
3. Valve boxes to be rectangular for remote control valves and ball or gate valves and round for quick coupling valves.
4. Valve box lid shall be labeled "IRRIGATION".

F. PULL BOXES AND SPLICE BOXES:

1. In paved areas, use Christy concrete utility box, size as required.
2. In planting areas, use Carson plastic underground enclosure with locking lid, bolt and washer, size as required, color to be green for potable water and purple for non-potable water systems.
3. Valve boxes to be rectangular for remote control valves and ball or gate valves and round for quick coupling valves.
4. Box lid to be labeled "IRRIGATION".

G. WIRE MESH AT VALVE BOXES:

1. 1/2 inch by 1/2", 16 gauge, galvanized wire mesh hardware cloth.

H. VALVE IDENTIFICATION TAGS:

1. Shall be plastic yellow in color for potable water systems and purple in color for recycled water systems with 1 1/8" stamped black letters indicating controller/station number.

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I. SAND BACKFILL:

1. Shall consist of natural sand, manufactured sand, existing of native material, or combinations thereof, and shall conform to ASTM C-40 Organic Impurities, ASTM D-2419 Sand Equivalent and a pH value between 4.5 and 9.

J. VALVE BOX ROCK:

1. Shall be $\frac{3}{4}$ " or smaller drain rock or pea gravel unless specified otherwise on Drawings.

K. VALVE BOX SUPPORT BRICK:

1. Shall be common red brick unless specified otherwise on Drawings.

2.4 AUTOMATIC-CONTROL SYSTEM:

A. CONTROLLER: As indicated on Drawings.

B. AUTOMATIC CONTROLLER GROUNDING:

1. Contractor shall install grounding recommended by manufacturer for installation method detailed on this product.

C. 24 VOLT WIRING:

1. All 24 V line to be #14-1 AWG-UF. Control wire insulation to be red in color and spare wire to be yellow in color. 24 V common wire to be #12-1 AWG-UF, insulation to be white in color and spare common insulation shall be black in color.

D. SPLICING MATERIALS:

1. Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial.

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E. CONNECTORS:

1. Shall be Splice-Kote, Dura Seal heat shrink waterproof nylon wire connectors, or 3M "DBY" connectors.

2.5 TRACER WIRE/DETECTABLE WARNING TAPE:

- A. Install tracer wire or detectable warning tape as indicated on Drawings.
- B. Tracer Wire: #8 solid Bare Copper Wire.
- C. Detectable Warning Tape: Electronically detectable plastic tape with metallic core, Terra Tape D, manufactured by Griffolyn Co., or equal, two (2) inches in width, continuously imprinted "caution buried water line".

2.6 CONCRETE THRUST BLOCKING:

- A. Shall be clean, Portland Cement Concrete, cast in place, five sacks of cement per cubic yard mixture with a 28-day compressive strength of 2,500 PSI.

2.7 SPRINKLERS AND/OR EMITTERS:

- A. As indicated on the drawings. Drip system fittings shall be of same manufacturer and/or as recommended by manufacturer.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Refer to Division 31 "Earthwork" for excavating, trenching, and backfilling.

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- B. Install piping and wiring in sleeves under sidewalks, roadways, and parking lots, and under or through footings and building walls.
 - 1. Install piping sleeves by boring or jacking under existing paving if possible.
 - 2. Install quantity and size of sleeves required for the project for irrigation piping, PVC for irrigation pipes and conduit for electrical wires.
 - 3. Sleeves shall extend twelve (12) inches beyond edges of paving and walls with ends capped.
- C. Provide minimum cover over top of underground piping according to the following:
 - 1. Irrigation Mainline Piping: Minimum depth of 24 inches below finished grade to top of pipe.
 - 2. Lateral Piping: Minimum depth of 18 inches below finished grade to top of pipe.
 - 3. Sleeves containing control wires, mainline and/or lateral piping beneath standard paving: Minimum depth of 24 inches from finish surface to top of sleeve.
 - 4. Sleeves containing control wires, mainline and/or lateral piping beneath vehicular paving including fire lanes/emergency vehicle access (EVA): Minimum depth of 36 inches from finish surface to top of sleeve.
 - 5. Drip Irrigation: Install drip and/or emitter lines and tubing as detailed on Drawings.
- D. Excavate trenches with vertical sides, uniform bottom, free of deleterious materials, and wide enough for pipes to lay side by side, fully supported on bottom. Minimum 3" clearance between pipes. Twelve (12") inch minimum width for mainlines and six (6") inch minimum width for lateral lines.
- E. Trenches with irrigation pipe and/or control wiring to be backfilled with sand to six (6) inches minimum above top of pipe. Continue backfilling in six (6) inch layers with soil free of rocks or waste materials. Compact soil to a density equal to the surrounding undisturbed soil, but not less than 90%. Any subsequent depressions filled at the Contractor's expense. Particular attention is directed to firmly tamp and moistening around sprinkler heads and quick-couplers.

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1. For Irrigation pipe three (3) inches and larger in size, install additional six (6) inch depth sand beneath piping.
- F. Trenches and backfill installed under paving, asphalt concrete or concrete shall be backfilled with sand and compacted in layers equal in density to the adjacent undisturbed soil or to 90% compaction, using manual or mechanical tamping devices. All trenches shall be left flush with the adjoining grade.
 1. The Contractor shall set in place, cap and pressure test pressurized mainline under paving prior to the paving installation.
 2. For irrigation pipes three (3) inches and larger in size, install additional six (6) inch depth sand beneath piping.

3.2 PREPARATION

- A. Set stakes to identify locations of proposed irrigation system. Obtain Owner's Representative's approval before excavation.

3.3 PIPING APPLICATIONS

- A. Install components having pressure rating equal to or greater than system operating pressure.
- B. Piping in control valve boxes and above ground may be joined with flanges instead of joints indicated.
- C. Above Ground Irrigation Mainline Piping: Use any of the following piping materials for each size range:
 1. NPS 4 and Smaller: Steel pipe; malleable-, gray-, or cast-iron fittings; and threaded joints.
 2. NPS 5 and Larger: Steel pipe; malleable-, gray-, or cast-iron fittings; and threaded joints.

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- D. Underground irrigation main piping shall be purple recycled water pipe, polyvinyl chloride (Type I) plastic pipe PVC 1120 and NSF approved, Schedule 40 PVC solvent-weld.
- E. Underground Irrigation Lateral (Circuit) piping shall be purple recycled water pipe, polyvinyl chloride (Type I) plastic pipe PVC 1120 and NSF approved, schedule 40 PVC solvent-weld.
- F. Mainline pipe sizes 6" and larger shall use gasketed pipe with bell fittings. Where solvent weld joints are required, contractor shall additionally install concrete thrust blocking.
- G. Underground Branches and Offsets at Sprinklers and Devices: Schedule 80, PVC pipe; threaded PVC fittings; and threaded joints.
- H. Mainline Fittings and Couplings: Schedule 80, PVC pipe, solvent weld up to 4" and gasketed with bell fittings 6" and larger pipe.
- I. Risers to Aboveground Sprinklers and Specialties: ASTM A-120 Schedule 40 galvanized steel pipe with 150 lb. banded galvanized malleable iron fittings.
- J. Double Swing Joint Assembly:
 - 1. Install double swing joint at all sprinkler heads and quick couplers.
 - 2. Elbows shall be PVC Class 1220, Schedule 40.
 - 3. Install as follows:
 - a. Screw 2 inch long nipple horizontally into plastic tee or ell at lateral line.
 - b. Screw on elbow and a 6 inch long nipple.
 - c. Screw on another elbow and a 2 inch long nipple and install riser vertically to head, or quick coupler valve.
 - d. Swing joint must offset to the right.
- K. Sleeves: Schedule 40 PVC pipe and socket fittings; and solvent-cemented joints.

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L. Transition Fittings: Use transition fittings for plastic-to-metal pipe connections according to the following:

1. Couplings:
 - a. Underground Piping NPS 1-1/2 and Smaller: Manufactured fitting or coupling.
 - b. Underground Piping NPS 2 and Larger: AWWA transition coupling.
2. Fittings:
 - a. Aboveground Piping: Plastic-to-metal transition fittings.
 - b. Underground Piping: Union with plastic end of same material as plastic piping.

M. Dielectric Fittings: Use dielectric fittings for dissimilar-metal pipe connections according to the following.

1. Underground Piping:
 - a. NPS 2 and Smaller: Dielectric couplings or dielectric nipples.
 - b. NPS 2-1/2 and Larger: Prohibited except in valve box.
2. Above ground Piping:
 - a. NPS 2 and Smaller: Dielectric unions.
 - b. NPS 2-1/2 to NPS 4: Dielectric flanges.
3. Piping in Valve Boxes or Vaults:
 - a. NPS 2 and Smaller: Dielectric unions.
 - b. NPS 2-1/2 to NPS 4: Dielectric flanges.
4. Dielectric fittings are specified in Division 22 Plumbing.

3.4 VALVE APPLICATIONS

A. Backflow Prevention Devices:

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1. New and relocated backflow devices must be tested at time of installation. Contractor shall have test performed by a Certified Backflow Tester who has a current State of California Contractor's license C-36 or General Contracting License.
2. For new backflow preventer installation, a Certified Tester shall test and provide results and certification to the Owner's Representative within five (5) days of the date of testing and to provide any testing data or certification required by the local water provider. A Department of Public Health sticker shall be placed on backflow device before the system is accepted by the Owner's Representative.
3. Install per local codes and water purveyor requirements.
4. A Department of Public Health sticker shall be placed on backflow device before the system is accepted by the Owner's Representative.

- B. Underground Gate/Ball Valves: Install in control-valve box as detailed on drawings.
- C. Underground, Manual Control Valves: Install in manual control-valve box as detailed on drawings.
- D. Remote Control Valves: Install in control-valve box as detailed on drawings.
- E. Drain Valves: Install in control-valve box as detailed on drawings.
- F. Install each valve in a separate valve box (unless noted otherwise in Drawings and details) and in appropriate locations as shown on Drawings. Allow 12 inches between valve boxes and between valve boxes and walls or walks or landscape edges. Boxes shall be arranged perpendicular and parallel to each other and aligned in a row.

3.5 PIPING INSTALLATION

- A. Location and Arrangement: Drawings indicate location and arrangement of piping systems. Install piping as indicated unless deviations are approved on Coordination

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Drawings. Piping shown on drawings is diagrammatic. General arrangement of piping shall be followed as near as practical. Where piping is shown running continuously in paving and adjacent to planting area, intent is to install piping within planting areas where practical.

- B. Install pipe sleeves at all points where pipes pass through concrete, asphalt or masonry. In footings, allow 1 inch clearance around pipe, and in other locations allow ½ inch. Each end of sleeve shall extend twelve (12) inches beyond edge of paving or structure above. Provide removable non-decaying plug at each end of sleeve to prevent intrusion of earth and debris.
- C. If drain valves are used, install piping at minimum uniform slope of 0.5 percent down toward drain valves.
- D. Install piping free of sags and vertical bends.
- E. Install groups of pipes parallel to each other, spaced to permit valve servicing.
- F. Install fittings for changes in direction and branch connections. Pipe bending shall not exceed manufacturer recommended radii.
- G. Install flanges adjacent to valves and to final connections to other components with NPS 2-1/2 or larger pipe connection.
- H. Install dielectric fittings to connect piping of dissimilar metals.
- I. Install underground thermoplastic piping according to ASTM D 2774 and ASTM F 690.
- J. Lay piping on solid sub-base, fully and evenly supported by bedding, uniformly sloped without humps or depressions.

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- K. Install PVC piping in dry weather when temperature is above 40 degrees F (5 degrees C). Allow joints to cure at least 24 hours at temperatures above 40 degrees F (5 degrees C) before testing unless otherwise recommended by manufacturer.
- L. Snake pipe a minimum of one (1) additional foot per one hundred (100) feet of pipe to allow for expansion and contraction.
- M. Cap or plug openings as soon as lines have been installed to prevent intrusion of debris.
- N. Install concrete thrust blocking, at a minimum, on pressurized mainline three (3) inches and four (4) in size at changes in direction, connections or branches from mainline and dead ends and as necessary to prevent pipe movement thrusts created by internal water pressure. Concrete shall be placed directly on the fitting perpendicular to the line of thrust and also against the undisturbed earth. The amount of concrete shall be in accordance to the pressure, angle and soil type. Refer to pipe manufacturer for calculating exact size of thrust blocking material, 2022 CPC and IAPMO installation standards.
- O. Joint Restraints: Install joint restraints per manufacturer recommendations on pressurized mainlines six (6) inches and larger at changes in direction, connections or branches from mainline and dead ends and as necessary to prevent pipe movement thrusts created by internal water pressure.
- P. After installation of pipe lines and sprinkler risers, and prior to installation of sprinkler heads, automatic valves and quick couplers, thoroughly flush all lines with a full head of water to remove any foreign material, scale, sediment, etc.

3.6 TRACER WIRE

- A. Install as detailed along all new irrigation mainline piping on bottom of trench, carefully run to avoid stress from backfilling and shall be continuous throughout the mainline pipe runs. Fasten tracer wire to mainline at eight (8) foot intervals with

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tape. Take precautions to ensure tape is not damaged or misplaced during backfill operations.

- B. Tracer wire shall follow mainline pipe and branch lines, originating in irrigation valve box at gate, ball or remote control valve located closest to irrigation point of connection and run to ball, gate and/or remote control valves at the end of mainline runs or shall loop entire system where mainlines are looped.
- C. Record locations of tracer wire origin and terminations on project record drawings.

3.7 DETECTABLE WARNING TAPE

- A. Install tape with printed side up, directly over mainline pipe and on top of sand backfill, 18 inches below grade. Take precautions to ensure tape is not damaged or misplaced during backfill operations.

3.8 JOINT CONSTRUCTION

- A. Refer to Plumbing Specifications Division 22 for basic pipe joint construction.
- B. Install threaded pipe joints as follows:
 - 1. Use pipe joint sealant for all plastic to plastic and plastic to steel joints, do not apply to sprinkler inlet ports.
 - 2. For PVC, hand tighten only. Do not over tighten threaded joints. Thread until fitting stops, then add a half turn.
 - 3. Use pipe joint compound and/or Teflon tape for all steel to steel joints.
- C. Install gasketed joint per manufacturer recommendations (printed on pipe material) and using the lubricant supplied with the pipe.

3.9 VALVE INSTALLATION

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- A. Underground Gate/Ball Valves: Install in valve box as detailed on drawings.
- B. Underground, Manual Control Valves: Install in manual control valve box as detailed on drawings.
- C. Remote Control Valves: Install in control valve box as detailed on drawings.
- D. Drain Valves: Install in control valve box as detailed on drawings.
- E. Install each valve in a separate valve box (unless noted otherwise in Drawings and details) and in appropriate locations as shown on Drawings. Allow 12 inches between valve boxes and between valve boxes and walls or walks or landscape edges. Boxes shall be arranged perpendicular and parallel to each other and aligned in a row.

3.10 SPRINKLER INSTALLATION

- A. Locate part-circle sprinklers to maintain a minimum distance of six (6) inches from adjacent paving and edges and twelve (12) inches clearance from walls, fences and other structures, unless otherwise indicated on Drawings.
- B. Spray sprinklers shall not be installed less than 24" from non-permeable surfaces unless the adjacent non-permeable surface is constructed to drain entirely to the landscape area.
- C. Swing Joint Assembly:
 - 1. Install triple swing joint at all sprinkler heads and quick couplers.
 - 2. Elbows shall be PVC Class 1220, Schedule 40.
 - 3. Install as follows:
 - a. Screw 2 inch long nipple horizontally into plastic tee or ell at lateral line.
 - b. Screw on elbow and a 6 inch long nipple.

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- c. Screw on another elbow and a 2 inch long nipple.
- d. Screw on another elbow and install riser vertically to head, or quick coupler valve.
- e. Swing joint must offset to the right.

D. Sprinkler Installation:

- 1. Install sprinklers heads as shown on drawings and details.
- 2. Install plumb to finish grade.
- 3. Tool tighten all sprinkler body covers and nozzles.

3.11 DRIP/EMITTER INSTALLATION

- A. Minimum cover sub-surface drip tubing: drip and/or emitter lines shall be installed as detailed with drip tubing installed four (4) inches grade and below the mulch top dressing layer.
- B. Minimum cover of tubing to individual shrubs: shrub bubbler tubing shall be installed to a depth of (4) inches and rising to the surface at target shrub rootball. No more than one (1) inch of tubing shall be exposed at shrub rootball.
- C. Backfill after lines have been reviewed, tested for leaks and approved by Owner's Representative.
- D. Assembling drip system shall keep pipe and tubing free from dirt and debris, pipe ends shall be cut square, deburred and cleaned.
- E. Flush piping prior to installing remote control valve assembly (control zone kit assembly).
- F. Follow manufacturer recommendations.

3.12 AUTOMATIC-CONTROL SYSTEM INSTALLATION:

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- A. Exact location of controllers shall be reviewed and approved by Owner's Representative.
- B. Provide connection to nearest available 110 volt electrical service.
- C. Contractor shall install grounding system per manufacturer recommendations.
- D. Prior to installation of hardscape, coordinate and install electrical supply and control wire conduit, size and quantity as required for each controller and spare wiring. Install pull boxes and conduit from clock location.
- E. Control wiring shall be neatly coiled beneath controller terminal strip and labeled with corresponding station number. Controller terminal strip cover plate shall fasten securely in place.
- F. Contractor is responsible to provide fully automatic system operated by specified controller(s). Contractor shall install quantity of red wiring equal to the number of stations on the specified irrigation controller(s), plus five (5) yellow spare control wires for each controller, a common white wire and a spare common black wire. Example, 24 station clock shall have 24 control wires, 5 spare control wires and 2 common wires installed with mainline and running through all associated valve boxes. Wires shall be installed per plans and details from remote control valve(s) to controller(s).
- G. Example of mainline that is not looped and terminates in 3 locations with a 24 station clock and 18 stations used:
 - 1. Wire quantities shall be:
 - a. 18 red control wires for stations 1-18
 - b. 6 red control wires for un-used stations 19-24
 - c. 1 white common wire
 - d. 1 black spare common wire
 - e. 5 yellow spare wires

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2. Wire runs:
 - a. 18 red control wires (stations 1-18) shall run from controller to corresponding valve.
 - b. 6 red control wires (un-used stations 19-24) shall run from controller with 2 running down each of the 3 mainline terminations and looping through each valve box.
 - c. 1 white common wire shall run from controller and connect to each valve associated with that controller.
 - d. 1 black spare common wire shall run from controller and connect to each valve associated with that controller.
 - e. 5 yellow spare control wires shall run from controller and loop through each valve box associated with that controller.
 3. Contractor shall label all wires with water-proof marking with corresponding station number or as spare control wire, spare common wire or spare stations 19-24.
- H. Wiring path is not shown on drawings and shall run from specified controller(s) to irrigation pull box if shown, then to the nearest irrigation mainline location, follow mainline (existing and/or new) to each remote control valve. Indicate wire location on record drawings where it does not follow mainline. Common and spare wires shall loop through entire system. Wiring may be shown on drawings only where required for future irrigation extensions.
- I. Wiring may be shown on drawings only where required for future irrigation extensions.
- J. Irrigation Central Control system is standard for this project.
- K. Irrigation Central Control System must be compatible with owners central control software and hardware. Contractor shall ensure controller communicates properly with project central computer and receives daily downloads for weather updates.

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3.13 CONNECTIONS/ELECTRICAL WIRING

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Ground equipment according to Division 16 Section.
- C. Connect wiring according to Division 16 Section.
- D. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- E. 24 volt splices to be made with 3M Co. #3577 splice kit, as to manufacturer's instructions. Splices to be made only at valve box or pull box.

3.14 REMOTE CONTROL VALVE WIRING

- A. Wires shall be installed in electrical conduit between controller and pull box. Pull box to be located in ground nearest controller. Top of box to be flush with finish grade.
- B. Provide separate irrigation wire sleeves under concrete or asphalt for irrigation wires, size and quantity as required, 24" minimum cover in planting areas and 36" minimum cover under fire lanes and pavements. All wires from the pull box shall be direct burial. The wiring shall be bundled and secured to the lower side of the irrigation pipe at 10 foot intervals with plastic electrical tape.
- C. Wires from the pull box shall be direct burial. The wiring shall be bundled and secured to the lower side of the irrigation pipe at ten (10) foot intervals with plastic electrical tape. Provide a minimum of 24 inches excess of coil of control wires in each 100 feet of run to controller. Sufficient slack shall be left in the wire to provide for expansion and contraction.

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- D. Provide 24 inches excess of coil of control wires in each 100 feet of run to controller.
- E. Provide 24 inches excess of coil of control wires in each valve box and pull box.
- F. Control wires to be buried a minimum of 24 inches below finish grade.
- G. Wiring shall be tested for continuity, open circuits and unintentional grounds prior to connecting to equipment.
- H. Install irrigation wire splice boxes where wire splices are necessary.

3.15 LABELING AND IDENTIFYING

- A. Valve Identification Tags: Install valve identification tag on each remote control valve with corresponding controller station number.

3.16 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service for Irrigation Pumps and Central Control Systems: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including connections. Report results in writing.
- B. Perform the following field tests and inspections in the presence of the Inspector and/or Owner's Representative with 72 hours advance notice. Contractor shall record date, time, names of those present and results and submit to Owner's Representative prior to requesting substantial completion review:
 - 1. Leak test of pressurized mainline: After installation of mainline and prior to installing remote control valves, quick coupling valves or other valve assemblies and prior to backfilling trenches, test the mainline for leaks as follows:

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- a. Testing shall occur with trenches open. Center load piping with small amounts of backfill between fittings to prevent pipe displacement, arching or slipping. Fittings to be visible for testing.
 - b. Exercise care in filling the system with water to prevent excessive surge pressure and water hammer
 - c. Test pressurized mainline piping under hydrostatic pressure of 125 psi for six (6) continuous hours, minimum, with no more than five (5) psi drop in pressure. Coordinate with Owner's Representative for initial observation of beginning test and observation after test.
 - d. Correct deficiencies revealed by test and repeat pressure test to the satisfaction of the Owner's Representative.
2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
3. Coverage Test: When the irrigation system has been completed, the Contractor, in the presence of the Architect and Owner's Representative, shall perform a Coverage Test to determine if the coverage of water is complete and adequate, the sprinkler heads and/or emitters function according to manufacturers' data and according to the intent of the construction documents. Replace irrigation components not performing satisfactorily and/or respace sprinklers and/or nozzles and/or emitters as necessary to provide complete irrigation coverage of plant material.
- a. For new turf areas, Contractor shall demonstrate irrigation coverage over amended planting area and prior to installation of sod and/or seeded turf.
4. Substantial Completion Review: At substantial completion of this Section, work shall be reviewed for conformance with the Drawings and Contractor shall make recommended repairs and/or corrections in a timely manner and prior to final completion.
- a. At substantial completion, Contractor shall submit documentation per 1.5 "Submittals at substantial completion" to Architect for review and acceptance.
 - b. At substantial completion, Contractor shall deliver spare parts to Owner's Representative per 1.5 "Submittals at substantial completion".

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- c. At substantial completion, contractor shall submit Certified Landscape Irrigation Auditor preliminary report on irrigation system.
- 5. Final Completion Review: After substantial completion repairs and/or corrections have been completed and at the end of the maintenance period, work shall be reviewed for final completion and approved by Owner's Representative in writing.

3.17 CLOSING IN UN-INSPECTED WORK

- A. The Contractor will pay all costs necessitated by required opening, restoration and correction of all work closed in or concealed before inspection, testing as required, and approval by authorized inspections.

3.18 STARTUP SERVICE

- A. Verify that controllers are installed and connected according to the Contract Documents.
- B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements in Division 16 Sections.
- C. Complete startup checks according to manufacturer's written instructions.

3.19 MAINTENANCE SCHEDULE

- A. Fine tune and adjust irrigation system weekly coinciding with the landscape and/or turf planting maintenance period.
- B. Adjust settings of controllers within WELO water budget and with seasonal changes.
- C. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.

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- D. Adjust sprinklers so they will be flush with, or not more than 1/2 inch above, finish grade.
- E. Fill irrigation trenches due to settling.

3.20 CLEANING

- A. Completely flush dirt and debris from piping before installing sprinklers and other devices.
- B. After completion, cleanup and remove all resultant debris from site.

3.21 DEMONSTRATION

- A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain controller and automatic control valves. Refer to Division 1 Section "Demonstration and Training."

3.22 GUARANTEE (Project Close-out Item)

- A. Furnish a written Guarantee to the Owner, dated from the date of Final Acceptance, against defective workmanship, materials or components and guaranteeing repair or replacement for a period of 1 year; further guarantee restoration of all damage caused by leaks in the Irrigation System for a like period.
- B. Guarantee that the entire installation was made in accordance with the drawings, specifications and manufacturer's recommendations, using designated materials and installation procedures.
- C. Submit duplicate copies of the Guarantee for approval by the Owner's Representative. Approval is mandatory before final payment and acceptance.

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- D. The guarantee for the irrigation system shall be made in accordance with the form attached at the end of this Section. The guarantee form shall be retyped onto the Contractors letterhead and contain the information shown.

End of Section

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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. Trees.
2. Shrubs.
3. Ground cover.
4. Vines.
5. Edgings.
6. Planters.
7. Raised Planters.

- B. Related Sections include the following:

1. Specification Section 01 56 39 "Tree and Plant Protection".
2. Specification Section 31 05 13 "Earthwork" for excavation, filling and rough grading and for subsurface aggregate drainage and drainage backfill materials.
3. Specification Section 32 84 00 "Planting Irrigation".

- C. Payment includes but is not limited to: furnishing and installing all trees, plants, soil and ground cover per plans.

1.3 DEFINITIONS

- A. Container-Grown Stock: Healthy, vigorous, well-rooted exterior plants grown in a container with well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to

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hold ball shape and protect root mass during shipping and be sized according to ANSI Z60.1 for kind, type, and size of exterior plant required.

- B. Finish Grade: Elevation of finished surface of planting soil.
- C. Import Topsoil: Shall be obtained from a local source and coming from a site with similar soil characteristics as the project site. Topsoil shall be fertile, friable, natural loam surface soil, reasonably free of subsoil, clay lumps, brush, weeds and other litter and free of roots, stumps, stones and rocks and other extraneous or toxic matter harmful to plant growth.
- D. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.
- E. On-site Topsoil: Naturally occurring, on-site, surface soil, usually occurring in the top four (4) to twelve (12) inches of original, undisturbed surface soil containing organic material, micro-organisms, necessary nutrients and minerals to sustain plant growth and be approved to sustain plant life by an approved soil and plant lab.
- F. Planting Soil: On-site topsoil, import topsoil or manufactured topsoil.
- G. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill, before placing planting soil.
- H. Plant material: Exterior plants contained within the planting plan legend in categories of Trees, Shrubs, Vines, Perennials, Annuals and/or Ground Covers.
- I. Substantial completion for landscape and irrigation: Work shall be considered substantially complete when irrigation, planting, turf planting and seeding are installed correctly per plans and specifications with only minor adjustments required and approval has been submitted in writing by Owner's Representative.

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- J. Final completion for landscape and irrigation: Work shall be considered complete when irrigation, planting, turf planting and seeding are installed correctly per plans and specifications and the maintenance period has been completed per plans and specifications and approval has been submitted in writing by Owner's Representative.

1.4 SUBMITTALS

- A. Product, Material Data and/or Samples: For each type of product specified. Submit manufacturer's technical data and installation instructions for landscape products conforming to requirements of Section 01 33 00 Submittal Procedures to include, but not be limited to:
 - 1. Samples for the following:
 - a. Organic mulch top dressing (1/2 c.f. each)
 - b. Edging materials and accessories, of manufacturer's standard size, to verify color selected.
 - 2. Manufacturer's certified analysis for standard products.
 - 3. Material Test Reports: For on-site topsoil, import topsoil and/or manufactured soil proposed for use on this project.
 - 4. Planting soil amendments as recommended by the soil testing laboratory (Lucchesi Plant & Soil Consulting, Waypoint Analytical California, Inc, or approved equal).
 - 5. Qualification Data: For landscape Installer in compliance with "Quality Assurance".
 - 6. Plant Materials List: Submit confirmation from supplier 30 days prior to planting that all plant material has been ordered.
 - 7. Product Certificates: For soil amendments and fertilizers, signed by product manufacturer shall be delivered to Owner's Representative upon delivery.
 - 8. Qualification Data: For landscape Installer prior to performing work.

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9. Planting Schedule: Indicating anticipated planting dates for each type of planting.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Experience: The landscape installation firm shall have contracted for and successfully completed construction of a minimum of five (5) California public construction projects of similar size, complexity, budget and scope.
2. Licensure: The landscape installation firm shall hold a current, active C27 "Landscaping Contractor" license classification by the California State License Board that has been consistently active for at least five (5) years and that has not been suspended or revoked.
3. Supervision: The landscape installation firm shall have a qualified and experienced landscape technician on site during landscape installation.

B. Soil Analysis: Furnish soil analysis by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity (CEC) or total exchangeable cations (TEC); sodium absorption ratio; deleterious material; pH; soluble salts, boron, mineral and plant-nutrient content of planting soil.

1. Report suitability of planting soil for plant growth. State recommended quantities of nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce a satisfactory planting soil.

C. Protect existing to remain and newly installed lawn and/or landscape areas from damage or trespass by maintaining construction fencing during construction and maintenance.

D. Provide quality, size, genus, species, and variety of exterior plants indicated, complying with applicable requirements in ANSI Z60.1, "American Standard for Nursery Stock."

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- E. Tree and Shrub Measurements: Measure according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size, and 12 inches above ground for larger sizes. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip-to-tip.
- F. Observation: Owner's Representative may observe trees and shrubs either at place of growth or at site before planting for compliance with requirements for genus, species, variety, size, and quality. Owner's Representative retains right to observe trees and shrubs further for size and condition of balls and root systems, insects, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.
 - 1. Notify Owner's Representative of sources of planting materials 30 days in advance of delivery to site.
- G. Pre-installation Conference: Conduct conference at Project site with General Contractor and/or Owner's Representative to comply with requirements in Division 1 Section "Project Management and Coordination."
- H. Protect all planting areas from trespass or damage by installing temporary barriers or protective fencing during construction. Barrier and/or fencing material and installation method shall be approved by Owner's Representative prior to installation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Notify Owner's Representative fourteen (14) days prior to anticipated plant material delivery to schedule review of plant material prior to installation.
- B. Do not prune trees and shrubs before delivery, except as approved by Owner's Representative. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective

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covering of exterior plants during delivery. Do not drop exterior plants during delivery.

- C. Handle planting stock by root ball.
- D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants trees in shade, protect from weather and mechanical damage, and keep roots moist.
 - 1. Do not remove container-grown stock from containers before time of planting.
 - 2. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.7 PROJECT/SITE CONDITIONS

- A. Prior to placing topsoil, Contractor shall collect and submit soil samples representative of on-site topsoil and/or import topsoil proposed for use in all planting and lawn areas to a Soil-Testing Laboratory for analysis and soil amending recommendations. Submit test results analysis and recommendations to Owner's Representative for review and approval prior to beginning work.
- B. Weather Limitations: Proceed with planting only when weather conditions permit.
- C. Coordination with Lawns: Plant trees and shrubs after finish grades are established and before planting lawns, unless otherwise acceptable to Owner's Representative.
 - 1. When planting trees and shrubs after lawns, protect lawn areas and promptly repair damage caused by planting operations.
- D. Contractor shall protect new plantings and/or delay planting in event of forecasted freezing temperatures.

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- E. Irrigation system shall be installed and operable before beginning planting operation.

1.8 WARRANTY

- A. Special Warranty: Warrant the following exterior plants, for the warranty period indicated, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by Owner or users, or incidents that are beyond Contractor's control.
 - 1. Warranty Period for Trees, Shrubs, Vines, Lawns and Ground Covers: One year from date of Final Completion.
 - 2. Remove dead exterior plants immediately. Replace immediately unless required to plant in the succeeding planting season.
 - 3. Replace exterior plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
 - 4. A limit of one replacement of each exterior plant will be required, except for losses or replacements due to failure to comply with requirements.

1.9 MAINTENANCE

- A. Plant Material and Planting Areas: Maintain for the following maintenance period by pruning, cultivating, watering, weeding, fertilizing, restoring planting basins, tightening and repairing stakes and guy supports, and resetting to proper grades or vertical position, as required to establish healthy, viable plantings. Spray as required to keep trees and shrubs free of insects and disease. Refer to "Maintenance Schedule."
 - 1. Maintenance Period: Ninety (90) days from date of Owners Representative's written approval of Substantial Completion of the planting and irrigation.
 - 2. In the event plant material fails during the maintenance period due to Contractor negligence, the maintenance period shall extend until 90% of the plant material is established as determined by the Owner's Representative.

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PART 2 - PRODUCTS

2.1 TREE, SHRUB AND VINE MATERIAL

- A. General: Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Grade: Provide trees and shrubs of sizes and grades complying with ANSI Z60.1 for type of trees and shrubs required. Trees and shrubs of a larger size may be used if acceptable to Owner's Representative, with a proportionate increase in size of roots or balls.
- C. Label at least one tree and one shrub of each variety and caliper with a securely attached, waterproof tag bearing legible designation of botanical and common name.
- D. If formal arrangements or consecutive order of trees or shrubs is shown, select stock for uniform height and spread, and number label to assure symmetry in planting.
- E. Provide plant material as specified on the Drawings including size, genus, species and variety.

2.2 SINGLE-TRUNK AND MULTI-TRUNK TREES

- A. Trees: Single-trunk or multi-trunk trees with straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.
 - 1. Branching Height: typical of tree species and container size, single trunk unless specified as multi-trunk on Planting Plan Legend. Select branching height in accordance with planting location. Low branching trees shall not be planted in conflict with pathways, driveways and/or structures.

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2. Single-stem trees shall have straight trunk, well-balanced crown, and intact leader, of height and caliper indicated, complying with ANSI Z60.1 for type of trees required.
3. Multi-stem trees shall branch naturally according to species and type, with relationship of caliper, height, and branching according to ANSI Z60.1.

2.3 GROUND COVER PLANTS

- A. Ground Cover: Provide ground cover of species indicated, established and well rooted in pots or similar containers, and complying with ANSI Z60.1.

2.4 PLANTS

- A. Annuals: Provide healthy, disease-free plants of species and variety shown or listed. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud and bloom.
- B. Perennials: Provide healthy, field-grown plants from a commercial nursery, of species and variety shown or listed, remove dead flowers.

2.5 TOPSOIL

- A. Prior to placing bid, Contractor to coordinate with General Contractor, Demolition and/or Grading Contractors and verify quantity and source of planting soil for all planting areas. Identify Contractor responsible for stockpiling on-site topsoil and/or acquiring import planting soil and installing a minimum of twelve (12) inches of planting soil in all landscape planting areas and any raised planters and rough grading in accordance with these specifications, details, notes, grading and drainage plans.
- B. Coordinate with General Contractor, Demolition and/or Grading Contractors for removal and replacement of lime treated soils and replacement with planting soil prior to planting to depth required to remove lime treatment. In event trees are planted in lime treated soils, trees shall have a minimum six (6) inch layer of

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planting soil below their rootball to provide a suitable substrate to root into for establishment.

- C. On-site topsoil: Re-use existing topsoil or existing surface soil, top twelve (12) inches excavated and stockpiled on-site. Verify suitability of existing and/or stockpiled surface soil to produce planting soil by submitting a sample to a soil testing laboratory. Acceptable on-site topsoil shall be ASTM D 5268, pH range of 5.7 to 7.5 (5.8 to 7.8 for predominantly California native plant species), representative of productive soils in the vicinity, a range of 4 to 20 percent organic material content; free of stones one (1) inch or larger in any dimension, roots, plants, sod, clay lumps and other extraneous materials harmful to plant growth. Sodium absorption rate (SAR) shall not exceed 5.0, conductivity of the saturation extract solution shall not exceed 3.0, and boron concentration in the saturation shall not exceed 1.0 ppm. Fine gravel (2-5 mm) and coarse gravel (5-12 mm) content shall not exceed 30%.
- D. Import Topsoil: Supplement with imported or manufactured topsoil from off-site, local sources, when quantities of on-site topsoil are insufficient. Do not obtain topsoil from bogs or marshes. If soil is obtained from agricultural land, Contractor shall submit proof soil is nematode free. Import topsoil shall meet the following requirements:
1. USDA Classification of fraction passing 2.0 mm sieve: sandy loam, sandy clay loam or loam.

Class	Particle Size Range	Maximum %	Minimum %
Coarse Sand	0.5 – 2mm	15	0
Silt	.002 - .05 mm	30	10
Clay	< .002 mm	25	10
Other Classes	Particle Size Range	Maximum %	Minimum %

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Gravel	2 – 13 mm	15	0
Rock	½ - 1 inch	5% by volume with none > 1 inch	
Organic		15	4

2. Chemistry – Suitability Considerations

Salinity: Saturation Extract Conductivity (ECe)	Less than 3.0 dS/m @ 25 degrees C.
Sodium: Sodium Adsorption Ratio (SAR)	Less than 6.00 ppm
Boron: Saturation Extract Concentration	Less than 1.00 ppm
Reaction: pH of Saturated Paste:	5.5 – 7.5 <u>without</u> high lime content.

3. Soil to contain sufficient quantities of available nitrogen, phosphorus, potassium, calcium and magnesium to support normal plant growth. In the event of nutrient inadequacies, provisions shall be made to add required materials prior to planting.
4. Soil testing: Contractor shall submit to the Owner's representative for approval, certification from an agricultural soils testing laboratory that the import topsoil provided conforms to the specifications prior to delivery of import or placement on on-site topsoil. Soil testing shall have been performed on import topsoil source within the previous year.

2.6 FERTILIZER AND SOIL AMENDMENTS

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- A. Contractor shall collect and submit sample of proposed planting soil, representative of the top eight (8) inches of planting soil, to a locally known soil testing laboratory, for analysis and amendment recommendations. Sample shall be representative of typical on-site topsoil proposed for use in planting areas.
- B. If import topsoil is proposed, import topsoil sample shall be submitted to a locally known soil testing laboratory, for analysis, amendment recommendations and installation recommendations.
- C. Contractor shall provide to the soil testing laboratory the following information when submitting soil for analysis:
 - 1. Project type (public school, commercial building, etc.).
 - 2. Anticipated maintenance (regular, low, none, etc.).
 - 3. Irrigation water source (potable or recycled).
 - 4. Proposed plant material type such as California native plants, turf, shrub and ground covers.
 - 5. Copy of this specification.
- D. Fertilizers: All fertilizers shall be of an approved brand with a guaranteed chemical analysis as required by USDA regulations and shall be dry and (except for plant tabs) free flowing.
- E. Nitrogen Stabilized Organic Amendment: 0-1/4 inch nitrogen-fortified organic amendment contributing at least 270 pounds of organic matter per cubic yard. Consider using Composted Greenwaste Soil Amendment, such as Z-Best Organic Compost from Zanker Landscape Materials (www.zankerlandscapematerials.com) or equal, if recommended by soil analysis laboratory. is acceptable if recommended by the soil testing laboratory (Lucchesi Plant & Soil Consulting, Waypoint Analytical California, Inc., or approved equal). Compost shall be obtained from a supplier participating in the Seal of Testing Assurance (STA) program of the U.S. Composting Council.

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1. In order to comply with MWELD 492.6, 3. (C). Soil Preparation, Mulch and Amendments, at a minimum, compost shall be applied at a rate of four (4) cubic yards per 1,000 square feet of permeable area incorporated to a depth of six (6) inches into the soil. Soils with greater than 6% of organic matter in the top six (6) inches are exempt from adding compost.
 2. Nitrogen stabilized sawdust shall not be used.
- F. Soil Preparation: The following materials and quantities are given for bidding purposes only and Contractor shall amend soil using products, quantities and methods specified by Soil and Plant Laboratory, or approved equal.
1. Nitrogen stabilized organic amendment.
 2. 6-20-20 granular fertilizer.
 3. Soil sulfur.
- G. Planting Tablets: 21 gram controlled release fertilizer supplying nitrogen for up to 1 ½ years and 20-10-5 content.
- H. Backfill Mix: Shall be a mixture of on-site or import topsoil, nitrogen stabilized organic amendment soil conditioner and fertilizer. For bidding purposes, backfill mix shall include 2/3 topsoil and 1/3 soil conditioner with 6-20-20 granular fertilizer, quantity per manufacturer, according to container or root stock size, mixed thoroughly.

2.7 MULCHES

- A. Due to variations in mulch sizes, Contractor shall remove large bark mulch in excess of approximately ¾" x ½" x 6" in size or 2.5 cubic inches in volume.
- B. MONTEREY COUNTY / SANTA CRUZ COUNTY (MPUSD, Salinas, etc.): Organic Mulch for non-bio-retention planting areas: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of untreated bark and wood trimmings. Walk-On Bark from Keith Day Landscape Supply.

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1. Address: 14201 Del Monte Blvd. Marina, CA 93933
 2. Phone: (831) 970-0486
 3. Website: <https://keithdaylandscapesupply.com/>
 4. Submit sample to Owners Representative's for review and approval.
- C. Organic Mulch for Bio-retention basin swales: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of organic shredded cedar bark from Pacific Landscape Supply, or approved equal.
1. Phone: (805) 595-2295
 2. Website: www.pacificlandscapesupply.com
 3. Email: sales@pacificlandscapesupply.com.
 4. Submit sample to Owners Representative's for review and approval.

2.8 HERBICIDES

- A. Pre-emergent: Ronstar-G, or approved equal. (ELIMINATE WHEN WEED BARRIER IS USED)
- B. Selective and non-selective Herbicides: EPA registered and approved, of type recommended by manufacturer for application.
- C. Contact Owner and obtain School District, Local, State and Federal policies and procedures for regulating application of chemical controls. Contractor shall comply with all applicable policies and/or procedures for application, posting and notifications.

2.9 WEED BLOCK FABRIC PRODUCTS

- A. WEED FABRIC/ WEED BLOCK FILTER FABRIC
1. Shall be Mirafi Mscape E (or approved equal) needle-punched, heat-treated, polypropylene, nonwoven landscape fabric designed specifically to act as a weed barrier, separator, and drainage filter. Product is inert to

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biological degradation and resistant to naturally encountered chemicals, alkalis, and acids.

- a. Product thickness to be 38 mils (mm) per ASTM D5199
- b. Roll Width to be 9 ft
- c. Roll Length to be 300 ft
- d. Apparent Opening Size (AOS) 40 U.S. Sieve (mm) per ASTM D4751
- e. Flow Rate of 175 gal/min/ft²
- f. UV Resistance after 500 hours to be 70% strength retention per ASTM D4355

B. WEED BLOCK STAPLES:

- 1. Shall be 6-inch 9-gauge galvanized steel landscaping staples, available through www.sandbaggy.com, or equal.

2.10 STAKES AND GUYS

- A. Upright and Guy Stakes: Rough-sawn, sound, new hardwood, redwood, or pressure-preservative-treated Douglas Fir or Lodgepole Pine, free of knots, holes, cross grain, and other defects, two (2) inches in diameter by length required, and pointed at one end.
- B. Guy and Tie Wire: ASTM A 641/A 641M, Class 1, galvanized-steel wire, 2-strand, twisted, 0.106 inch in diameter.
- C. Guy Cable: 5-strand, 3/16-inch- diameter, galvanized-steel cable, with zinc-coated turnbuckles, a minimum of 3 inches long, with two 3/8-inch galvanized eyebolts.

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- D. Tree Ties: Z-Strap tree ties, or equal, made of one (1) inch wide by ¼" thick, black rubber recycled tire rubber with pre-punched nail holes, a tensile strength of 400 psi, a breaking strength of 75 pounds per inch of width and resistant to ozone deterioration. Contact Sullivan & Mann Lumber Company, Inc. (900) 899-3312 (www.sullivanandmann.com).
- E. Flags: Standard surveyor's plastic flagging tape, white, 6 inches long

2.11 LANDSCAPE EDGINGS/HEADERBOARD

- A. Of sizes shown, and as follows:
 - 1. Species: Construction Heart Redwood.
 - 2. Stakes: Construction heart redwood, 1 by 2 by 16 inches long in nominal size, with galvanized nails for anchoring edging.
 - 3. Splice Plate: Same species as edging, 1 by 6 by 24 inches long in nominal size, with galvanized nails for securing in place.

2.12 WATER

- A. Water shall be suitable for irrigation and free from ingredients harmful to planting areas.

2.13 MISCELLANEOUS PRODUCTS

- A. Tree Trunk Guard: nine (9) inch high by four (4) inch diameter plastic, corrugated tube, Arbor Guard + or equal.
- B. Tree Root Barriers: 18" high by 24" wide, interlocking panels of not less than 0.080" (2.032 mm) thickness, black in color, at least 50% recycled material, injection molded plastic product for linear applications with ultra-violet inhibitors with anti-lift ground lock tabs, vertical root deflecting ribs and double top edge consisting of two parallel, horizontal ribs on the top.

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- C. Jute Netting: Biodegradable in two (2) to three (3) years from installation, absorbing water four to five times fabric weight, open area 60% to 65%, available in rolls four (4) feet in width. Use galvanized steel staples as recommended by manufacturer to secure netting in place.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas to receive exterior plants for compliance with requirements and conditions affecting installation and performance. Proceed with installation only after unsatisfactory conditions have been corrected.
- B. Planting operations shall be performed when weather and soil conditions are suitable for planting.

3.2 PREPARATION

- A. 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.
- B. Protect structures, utilities, sidewalks, pavements, and other facilities, and lawns and existing exterior plants from damage caused by planting operations.
- C. Install protective barriers and/or fencing as necessary.
- D. Contact and obtain Owner's Representative, Local, State and Federal policies and procedures for regulating application of fertilizers, fungicides, insecticides, pesticides and herbicides. Contractor shall comply with all applicable policies and/or procedures for application, posting and notifications.
- E. Do not excavate, place soils or amend soils during wet or saturated conditions.

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- F. If lime treated soils have not been removed from proposed planting areas, remove and replace with acceptable topsoil.
 - G. Verify depth of planting soil in proposed planting areas. If depth of planting soil is less than twelve (12) inches in depth, install additional planting soil to ensure twelve (12) inch minimum depth of topsoil.
 - H. Import topsoil Installation:
 - 1. Remove and disposed of stones larger than one (1) inch in any dimension, vegetation and foreign inorganic material from surface to receive import topsoil.
 - 2. Scarify or plow the subgrade by crossripping or equivalent to a minimum depth of four (4) inches until it is loose and uncompacted to provide bonding of imported planting soil layer to subgrade.
 - 3. Place planting soil on loosened material in four (4) inch layers. Crossrip first import planting soil layer to a depth of eight (8) inches and blend import planting soil with loose native surface soil. Roll lightly with appropriate lawn roller to consolidate soil and compact to 85% density.
 - 4. Continue placement of planting soil after blending first layer with native soil in four (4) inch layers and rolling lightly to consolidate and compact each layer of soil and compact to 85% density.
 - 5. Place topsoil to the lines and grades in accordance with grading Drawings.
 - 6. Verify installation of topsoil to minimum depth of twelve (12) inches over subgrade soil and rough grading is completed to proper slopes and elevations.
- 3.3 SOIL AMENDING AND FINE GRADING (Amend per Soil-Testing Laboratory recommendations. The following amendment recommendations are given for bidding purposes only.) Contractor shall prepare and amend soil over entire planting areas and as recommended for backfill at individual planting pits.
- A. Soil Preparation: Loosen subgrade of planting beds by crossripping or equivalent cultivation to a minimum depth of ten (10) inches. Remove stones larger than one

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(1) inch in any dimension and sticks, roots, rubbish, and other extraneous matter in the top six (6) inches of soil and legally dispose of them off Owner's property.

- B. Soil Amending: (Amend per Soil-Testing Laboratory recommendations. The following recommendations are provided for bidding purposes only. Contractor shall amend soil for over-all preparation and amendment recommendations and for planting pit preparation, amendments and backfill) Add the following and thoroughly till into the top eight (8) inches of planting soil at the following rates per 1,000 square feet. Till planting soil to a homogeneous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter. Float, rake and roll all planter areas to establish finished grades, maintaining drainage patterns and swales for grading and drainage plans, creating smooth, uniform surface plane.
1. 6 cubic yards nitrogen fortified organic soil amendment.
 2. 14 pounds all-purpose granular fertilizer (6-20-20).
 3. 15 pounds soil sulfur.
- C. Roll amended soil lightly with appropriate lawn roller to consolidate soil and compact to 85% density.
- D. Fine Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Refer to civil grading plans and conform to designed grades, drainage patterns, swales, and ridges.
1. There shall be no areas that hold water or drain toward buildings or structures, unless designed per civil grading plans.
 2. In planting areas, set finish grade of soil one and one half (1 1/2) inches below adjacent paved surfaces, utility boxes, tops of curbs, and the like to allow for installation of organic mulch top dressing above.
 3. Regrade as necessary to restore grades and drainage patterns after installation of plant material.

3.4 EDGING/HEADERBOARD INSTALLATION

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- A. Redwood Headerboard: Install wood headers or edgings where indicated. Anchor with wood stakes spaced per detail, driven at least 1 inch below top elevation of header or edging. Use 2 galvanized nails per stake to fasten headers and edging; length as needed to penetrate both members and provide 1/2-inch clinch at point. Chamfer top of stakes as indicated on detail and pre-drill stakes if needed to avoid splitting

3.5 PLANT MATERIAL EXCAVATION

- A. Lay out individual tree and shrub locations and areas for multiple exterior plantings. Stake locations, outline areas, adjust locations when requested, and obtain Owner's Representative's acceptance of layout before planting. Make minor adjustments as required.
- B. Lay out exterior plants at locations directed by Owner's Representative. Stake locations of individual trees and shrubs and outline areas for multiple plantings.
- C. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
 - 1. Excavate approximately planting pit sizes as indicated on planting details.
 - 2. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots.
 - 3. Set rootball onto compacted native soil so that rootball sits one (1) inch above adjacent finish grade.
- D. Obstructions: Notify Owner's Representative if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
- E. Drainage: Notify Owner's Representative if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.

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- F. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.6 PLANT MATERIAL PLANTING

- A. Carefully remove root ball from container without damaging root ball or plant.
- B. Set container grown planting stock plumb and in center of pit or trench with top of root ball one (1) inch above adjacent finish grades. Face plant material for best appearance.
- C. Place amended backfill around root ball in layers, tamping to settle mix and eliminate voids and air pockets. When pit is approximately one-half backfilled, water thoroughly.
- D. Place planting tablets in hole about one (1) to two (2) inches away from root tips. Refer to manufacturer's recommendation for exact quantity, but not less than:

Plant Size	Quantity	Plant Size	Quantity
1 Gallon Container	1	7-Gallon Container	5
2-Gallon Container	2	15-Gallon Container	8
3-Gallon Container	3	24" box container	20
5-Gallon Container	3	36" box container	30

- E. Finish placing remainder of backfill. Repeat watering until no more water is absorbed. Water again after placing and tamping final layer of planting soil.

3.7 TREE AND SHRUB PRUNING

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- A. Prune, thin, and shape trees and shrubs as directed by Owner's Representative.
- B. General Tree Pruning Procedures:
 - 1. Prune trees according to ANSI A300 (Part 1). Prune trees for long term structural integrity.
 - 2. Cut branches with sharp pruning instruments; do not break, tear or chop. Pruning Standards: Prune trees according to ANSI A300 (Part 1).
 - 3. Do not apply pruning paint to wounds.
- C. Pruning Goals (Prune as per the following and under the direction of a Certified Arborist):
 - 1. Prune trees to remain to compensate for root loss caused by construction damage. Provide subsequent maintenance during landscape irrigation and planting maintenance period and until "final completion" as recommended by Certified Arborist.
 - 2. Prune to remove dead wood, promote proper structure, thin and open canopy and for general health for the specific tree species.
 - 3. Prune for clearance from structures, pathways and driveways and streets and for a balanced canopy.
- D. Shrubs, Vines and Ground Covers:
 - 1. Prune, thin and shape shrubs according to standard horticultural practices.
 - 2. Prune to remove injured or dead branches from shrubs.

3.8 GUYING AND STAKING

- A. Upright Staking and Tying: Unless detailed otherwise, use a minimum of 2 stakes of length required to penetrate at least six (6) inches below bottom of backfilled excavation and to extend at least 72 inches above grade. Set vertical stakes and space to avoid penetrating root balls or root masses. Brace tree stakes with wood horizontal bracing screwed in place. Support trees with two rubber tree tie sections at contact points with the tree trunk installed in a "figure 8" wrap. Allow enough slack to avoid

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rigid restraint of tree. Trim stakes below tree canopy and to matching heights. Use the number of stakes as follows:

1. Use 2 stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper.
2. Use 3 stakes for trees more than 12 feet high and up to 4 inches in caliper. Space stakes equally around trees.
3. Use 3 stakes for trees of all sizes if detailed otherwise on Drawings.

B. Guying and Staking: Guy and stake trees exceeding 14 feet in height and more than 3 inches in caliper, unless otherwise indicated. Securely attach no fewer than 3 guys to stakes 30 inches long, driven to grade.

1. For trees more than 6 inches in caliper, anchor guys to pressure-preservative-treated deadmen 8 inches in diameter and 48 inches long buried at least 36 inches below grade. Provide turnbuckles for each guy wire and tighten securely.
2. Attach flags to each guy wire, 30 inches above finish grade.
3. Paint turnbuckles with luminescent white paint.

3.9 TREE ROOT BARRIERS

- A. Install root barriers where trees are planted within six (6) feet of any pavement or structures.
- B. A linear root barrier shall be installed flush with the vertical edge of pavement or structure, one half (1/2) inch below the top of the pavement and shall extend six (6) feet in each direction for a total of twelve (12) feet in length. Contractor shall remove concrete spillage if necessary to install barrier flush against vertical concrete edge.

3.10 TREE TRUNK GUARD: install to protect newly planted tree trunks planted in lawns according to manufacturer recommendations.

3.11 RAISED PLANTERS

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- A. Fill raised planters with Supersoil® or equal potting soil, blend of organic materials, natural and traditional fertilizers, formulated for outdoor container plants with no fertilizing required for up to ninety (90) days after planting.

- 1. Place potting soil in twelve (12) inch deep, compacted layers to 85% relative density to an elevation of four (4) inches below the top of the raised planter (unless detailed otherwise on Drawings).

3.12 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants spaced as indicated on planting legend.
- B. Dig holes large enough to allow spreading of roots, and backfill with planting soil.
- C. Work planting soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- D. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- E. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.13 PRE-EMERGENT (ELIMINATE WHEN WEED BLOCK FABRIC IS USED)

- A. Apply pre-emergent herbicide per manufacturer recommendations in new planting areas.

3.14 WEED BLOCK FABRIC

- A. Prior to installing mulch in planting beds, install weed block filter fabric per manufacturer recommendations over entire shrub and tree planting beds. Rake grade to receive fabric to a smooth and uniform surface. Roll fabric over surface and overlap seams 12" on sides. When installing on a slope, lay fabric lengthwise up and down the slope. Fabric shall lay flush with grade without wrinkles or loose edges and

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installed in such a manner that fabric is completely concealed beneath mulch surfacing material.

- B. Do not install weed block filter fabric within 2" of (n) or (e) plant stems and 6" of (n) or (e) tree trunks.
- C. Secure weed block fabric using 6-inch, 9-gauge galvanized steel landscaping staples, available through sandbaggy.com or equal. Staples to be installed at 18" O.C. max in all directions.

3.15 JUTE NETTING

- A. Install jute netting on slopes exceeding 3:1 ratio slope. Apply jute netting after preparing planting soil for planting and fine grading. Secure jute netting starting at the top of the slope by laying six (6) inches of fabric below grade to a minimum depth of six (6) inches. Roll jute netting down slope and terminate where grade becomes level by folding six (6) inches of fabric underneath. Overlap seems four (4) to six (6) inches. Secure in place using staples placed eighteen (18) inches on center spacing. After completion of planting operations, install top dressing organic mulch as specified herein.

3.16 PLANTING BED MULCHING

- A. Apply three (3) inch minimum thickness of organic mulch, unless specified otherwise on Drawings, continuously throughout planting areas. Do not place mulch within two (2) inches of stems and six (6) inches of tree trunks.

3.17 CLEANUP AND PROTECTION

- A. During exterior planting, keep adjacent paving and construction work area in a clean and orderly condition.

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- B. Protect exterior plants from damage due to landscape operations, operations by other contractors and trades, and others. Maintain protection during installation treat, repair, or replace damaged exterior planting.
- C. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property.

3.18 MAINTENANCE SCHEDULE

- A. Protection: Protect work from damage, erosion and trespass. Maintain temporary fencing and/or barriers in proper condition. Remove temporary fencing and/or barriers prior to final completion and at end of maintenance period.
- B. Water: Contractor shall be solely responsible for ensuring that all planting is sufficiently watered to promote vigorous growth. Test and inspect irrigation system on a regular basis. Adjust and repair the irrigation system and its components as necessary for plant establishment and growth and for watering efficiency. Check and adjust any obstructions to emission devices.
- C. Fertilizing recommendations (confirm with the soil testing laboratory): Immediately after completion of planting, fertilize landscape areas with ammonium sulfate (21-0-0) fertilizer at a rate of five (5) pounds per 1000 square feet. Fertilize with specified fertilizer after 45 days, prior to end of maintenance period. After landscape becomes well-established, fertilize in fall and spring with (16-6-8) commercial fertilizer at a rate of six (6) pounds per 1000 square feet.
- D. Weed Control: Maintain planting beds (planted or not) in a weed-free condition to be performed weekly during maintenance period. Weeding may be done manually or by the use of selective herbicides. (Contractor shall obtain written approval from project owner prior to application of herbicide) No herbicide shall be used without the Owner Representative's prior consent. Use only approved herbicides, use in accordance with manufacturer's recommendations and per Pest Control Advisor's recommendations. If selective herbicides are used, extreme caution shall be observed

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so as not to damage any other plants. Spraying shall be done only under windless conditions.

- E. Disease, Pest and Insect Control: Disease, pest (including, but not limited to, birds and rodents) and insect damage shall be controlled by the use of fungicides, insecticides pesticides, poisons and/or mechanical means. (Contractor shall obtain written approval from project owner prior to application of fungicides, insecticides or pesticides or mechanical methods). Review and perform weekly during maintenance period.
- F. Plant Material: Maintain trees, shrubs and other plants by pruning, cultivating and weeding as required for healthy growth. Restore planting pits as necessary. Tighten and repair stake supports and reset trees and shrubs to proper grades or vertical position as required. Review and perform weekly during maintenance period.
- G. Organic Mulch: Re-apply organic mulch top dressing after initial settling and again prior to end of maintenance to ensure specified depth is achieved.
- H. End of maintenance shall be reviewed and approved in writing by Owner's Representative. Upon approval, Contractor shall notify Owner's Representative in writing when maintenance is complete with a date which maintenance transfers to Owner.

3.19 FIELD QUALITY CONTROL, SUBSTANTIAL COMPLETION AND FINAL COMPLETION

- A. Owner's Representative shall inspect and approve the following prior to proceeding with subsequent work:
 - 1. Preparation: at completion of finish grading and prior to planting, grading tolerances and soil preparation shall be checked for conformance to Drawings and as specified herein.
 - 2. Layout: Layout of all plants, headerboard and other major elements shall be directed and/or approved by Owner's Representative.

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3. Substantial Completion Review: At substantial completion of this Section, work shall be reviewed for conformance with the Drawings and Contractor shall make recommended repairs and/or corrections in a timely manner.
 4. Final Completion Review: After substantial completion repairs and/or corrections have been completed, work shall be reviewed for final completion and approved by Owner's Representative in writing.
- B. Re-inspections required due to Contractor not being prepared or non-conformance to Drawings shall be back charged to the Contractor.
- C. Contractor shall remove protective fencing and/or barriers prior to final completion review.

Storm and Sanitary Specifications

1. 02 23 30 – Site Clearing
2. 31 23 00 – Excavation and Fill
3. 33 31 00 – Sanitary
4. 33 41 00 - Storm

SECTION 02230

SITE CLEARING & DEMOLITION

1. Clean and careful manner shall be the use of pruning shears, saws, and cutting roots in a manner that does not tear or rip protective outer layer of the root.
- B. Topsoil: Topsoil is defined as friable clay loam surface soil found in existing planting areas subject to disturbance (cut or fill) a depth of not less than 6- inches (measured from finished grade after clearing and grubbing have been completed). Satisfactory topsoil shall be free of deleterious material including but not limited to, clay lumps, stones and other objects over ¾-inch in diameter, and without weeds or roots. See Top Soil Section for additional requirements.
 1. Contractor shall strip any growth of grass and other vegetation, and remove before stripping. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
 2. Stockpile stripped topsoil in storage piles directed by owners representatives. Construct storage piles to provide free drainage of surface water. Cover stockpiles to prevent erosion from wind or water.
 3. Dispose of unsuitable materials in a manner specified in 3.02.
- C. Clearing and Grubbing: Clear site of trees, shrubs, and other vegetation, except for those indicated.
 1. Completely remove deleterious materials, including, but not limited to stumps, roots, and other debris.
 2. Fill depressions caused by clearing and grubbing operations with satisfactory soil materials that are in accordance with the soils report. If the soils report does not address filling of depressions, the following requirements shall be used.
 - a. Place fill materials in horizontal layers not exceeding 6 inches (150 mm) loose depth, and thoroughly compact each layer to a minimum density of 85% compaction. This compaction effort shall not relieve the Contractor of any other obligation for compaction that may be required under the specifications for earthwork.

3.02 DISPOSAL OF WASTE MATERIALS

- A. Removal from Owner's Property: Remove waste materials (including, but not necessarily limited to concrete, gas line, water line, sanitary and storm line) and unsuitable or excess topsoil from Owner's property and dispose of in accordance with CALTRANS Standard Specification Section 7-1.13.
- B. Permits: Contractor shall obtain all necessary permits and/or approvals and pay all applicable fees including but not limited to, permit fees, license fees and disposal fees associated with the removal, haulage and disposal of waste materials from the Owner's Property.
- C. Covered Vehicles: All loads of waste materials carried by trucks or other vehicles shall be fully covered by tarpaulins or similar devices as approved by the California State Highway Patrol in such a manner that will ensure that no portion of the load will be discharged during transit to the disposal site.
- D. Maintenance of Adjacent Streets: The Contractor shall maintain the public streets adjacent to the construction site free of debris or materials posing a hazard to the public traveling along roadway. Contractor shall sweep and wash down all paved areas within the public street rights-of-way at the end of each working day or as otherwise directed by the Owner's representative.

END OF SECTION

SECTION 31 2300

EXCAVATION AND FILL

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Civil drawings
- B. Drawings, general provisions of Contract Agreement Form including Appendices and Exhibits, Division 1 Specification Section, and California Building Code, Title 24, Part 2 and appropriate sections for educational facilities apply to this Section.
- C. Standard specifications of the state of California, Department of Transportation (CALTRANS).

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Excavating and backfilling for underground mechanical and electrical utilities and appurtenances.
- B. Related Sections: The following Sections contain requirements that relate to this Section.
- C. Reference Standards:
 - 1. Contractor shall perform work in accordance with applicable requirements of state and local agencies having jurisdiction over the project. Contractor shall perform work in accordance with applicable standards and requirements of utility companies.
 - 2. American Association of State Highway and Transportation Officials (AASHTO): Standards.
 - 3. American National Standards Institute (ANSI): Standards.
 - 4. American Society of Testing Materials (ASTM):
 - a. Materials and testing standards as identified throughout this Section.
 - b. ASTM D2487 "Classification of Soils for Engineering Purposes."
 - 5. California, Department of Transportation (CALTRANS): Standard Specifications.
 - 6. California Occupational Safety and Health Administration (CALOSHA): Construction Safety Orders.
 - a. California State Industrial Accident Commission (CSIAC): Trench Construction Safety Orders.
 - b. U.S. Occupational Safety and Health Administration (OSHA): Standards - 29 CFR, PART 1926 Safety and Health Regulations for Construction, Subpart P - Excavations.

1.03 DEFINITIONS

- A. Excavation consists of the removal of material encountered to subgrade elevations and the reuse or disposal of materials removed.
- B. Subgrade: The uppermost surface of an excavation or the top surface of a fill or backfill immediately below base or subbase, drainage fill, or topsoil materials.

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EXCAVATION AND FILL

- C. Borrow: Soil material obtained off-site when sufficient approved soil material is not available from excavations.
- D. Subbase Course: The layer placed between the subgrade and base course in a paving system or the layer placed between the subgrade and surface of a pavement or walk.
- E. Base Course: The layer placed between the subbase or subgrade and surface pavement in a paving system.
- F. Drainage Fill: Course of washed granular material supporting slab-on-grade placed to cut off upward capillary flow of pore water.
- G. Unauthorized excavation consists of removing materials beyond indicated subgrade elevations or dimensions without direction by the Owner's representative. Unauthorized excavation, as well as remedial work directed by the Owner's representative, shall be at the Contractor's sole risk and expense.
- H. Unsuitable Soil: Poor yielding soil that the Owner's representative determines as unsatisfactory for footings, slabs, trenches or pavement subgrades.
- I. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below ground surface.
- J. Utilities: include on-site underground pipes, conduits, ducts, and cables, as well as underground services within building lines.
- K. Waste Material: Excess material generated from utility trenches, pavement sections, or other structures associated with the project.

1.04 SUBMITTALS

- A. Wet Weather Construction Plan: Contractor shall submit a plan outlining procedures and methods that shall be implemented during the wet weather construction, plan shall address the following:
 - 1. Open trench protection;
 - 2. Protection of exposed soils (graded or stockpiled);
 - 3. Protection of materials (pipe, conduit, wiring or other pertinent items).
- B. Test Reports: In addition to test reports required under field quality control, submit the following:
 - 1. Laboratory analysis of each soil material proposed for fill and backfill from on-site and borrow sources, including drainage fill;
 - 2. One optimum moisture-maximum density curve for each soil material;
 - 3. Report of actual unconfined compressive strength and/or results of bearing tests of each stratum tested.

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EXCAVATION AND FILL

1.05 QUALITY ASSURANCE

- A. Codes and Standards: Perform earthwork complying with requirements set forth on the plans, in the soils report, or as required under applicable ordinances or codes of all governmental agencies having jurisdiction over the project.
- B. Testing and Inspection Service: Owner will employ a qualified independent geotechnical engineering testing agency to classify proposed on-site and borrow soils to verify that soils comply with specified requirements and to perform required field and laboratory testing if needed.
- C. Safety Standards: All excavation should be constructed in accordance with OSHA and CAL-OSHA Safety Standards. Safety in and around utility trench is the responsibility of the underground contractors.
- D. Pre-installation Conference: Conduct conference at Project site.
 - 1. Before commencing earthwork, meet with representatives of the governing authorities, Owner, Owner's representative, consultants, Geotechnical Engineer, independent testing agency, and other concerned entities. Review earthwork procedures and responsibilities including testing and inspection procedures and requirements. Notify participants at least 3 working days prior to convening conference. Record discussions and agreements and furnish a copy to each participant.

1.06 PROJECT CONDITIONS

- A. General:
 - 1. Earthwork operations shall be conducted so as to prevent windblown dust and dirt from interfering with the surrounding normal operations. Contractor shall assume liability for all claims of windblown damage and dirt. Since the area of disturbance is less than 1 acre, a Storm Water Pollution Prevention Plan (SWPPP) has not been prepared for the project, but Best Management Practices (BMP's) will be employed on-site.
 - 2. Bench Marks, monuments, signs and other reference points shall be maintained and protected; if disturbed or destroyed, they shall be replaced by the Contractor as directed by the Owner at the Contractors expense.
- B. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted in writing by the Owner's representative and then only after acceptable temporary utility services have been provided.
 - 1. Provide a minimum 2-working days notice to the Owner's representative and receive written notice to proceed before interrupting any utility.
 - 2. Notify Underground Service Alert (USA) at (800) 227-2600 at least two working days prior to beginning removal, grading, excavation, trenching, or other earthwork related activities.
- C. Demolish and completely remove from site existing underground utilities indicated to be removed. Coordinate with utility companies to shutoff services if lines are active. Coordinate with Scotts Valley Water District and City of Scotts Valley Public Works for service connections.

SECTION 31 2300

EXCAVATION AND FILL

PART 2 - PRODUCTS

2.01 SOIL MATERIALS

- A. Backfill and Fill Materials: Satisfactory soil material shall be on-site soil materials with an organic content of less than 3-percent by weight or without visible organ matter and free of deleterious materials or hazardous substances may be used as engineered fill. On-site soil material to be reviewed by Owner's Geotechnical Engineer for satisfactory conditions prior to incorporation into earthwork.
- B. Subbase and Base Material: Naturally or artificially graded mixture of natural (non-recycled) or crushed gravel, crushed stone, and natural or crushed sand, conforming with CALTRANS Class 2 aggregate base or ASTM D2940, with at least 95 percent passing a 1-1/2 inch (38 mm) sieve and not more than 8 percent passing a No. 200 (75 micrometer) sieve as approved by the project Geotechnical Engineer.
- C. Engineered Fill: Subbase or base materials approved by Geotechnical Engineer. In general, engineered fill shall be predominantly granular, shall not contain any rocks or lumps larger than 3-inches in greatest dimension, shall not contain more than 15- percent of material larger than 1 ½ inches, shall have a Plastic Index of 15 or less, and shall contain sufficient fines to allow excavation to be made without caving. All import fill shall meet the requirements of engineered fill and shall be approved by the Owner's Geotechnical Engineer prior to incorporation into the earthwork.
- D. Pipe and Conduit Bedding Material: Bedding material shall be clean, washed, granular material derived from decomposed or crushed rock. Such material shall be free of organic material, mica, clay, silts, oils, and other deleterious materials. Sand bedding shall have a maximum particle size of 1/4-inch with gradation that allows 90 to 100 percent passing a No. 4 sieve and not more than 10 percent to pass a No. 200 sieve.
- E. Drainage Fill: Washed, poorly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2 inch (38 mm) sieve and not more than 5 percent passing a No. 8 (2.36 mm) sieve.
- F. Filtering Material: Poorly graded mixture of natural or crushed gravel or crushed stone and natural sand, with 100 percent passing a 1-1/2 inch (38 mm) sieve and 0 to 5 percent passing a No. 50 (300 micrometer) sieve.
- G. Fill: On-site soil free of organic material, debris, rocks, and clods and approved by the Project Geotechnical Engineer.
- H. Topsoil: Material excavated from the project site with sufficient organic content to render it unsuitable for engineered fill, but which can be used for landscaping purposes. Material must be free of roots, rocks larger than ½ inch, debris, vegetation, and foreign or deleterious material which may be harmful to plant growth. Stockpile organic laden topsoil in the location indicated on the plans or as directed by the Owner's representative.
- I. Controlled Low Strength Material (CLSM): Backfill material substitution when shallow depths are required for utility installation. May also be used for correction of unauthorized excavation per Section 3.08 below. See Section 3.10 Below for requirements.

SECTION 31 2300

EXCAVATION AND FILL

PART 3 - EXECUTION

3.01 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earthwork operations.
- B. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.02 DEWATERING

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

3.03 EXCAVATION

- A. Explosives: Do not use explosives.
- B. Hand Digging: If determined by Owner, or Owner's representatives, utilities including but not limited to, fiber optic, telephone, signal wire, and electrical wire shall be carefully excavated by hand digging or other protective methods approved by the owners representatives.
- C. General:
 - 1. Contractor shall excavate to required subgrade elevations regardless of the character of material and obstructions encountered.
 - 2. All excavation should be constructed in accordance with OSHA and CAL-OSHA Safety Standards. Safety in and around utility trenches is the responsibility of the underground contractor.

3.04 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1.2 inches (30 mm). Extend excavations a sufficient distance from structures for placing and removing concrete formwork, installing services and other construction, and for inspections.
 - 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade immediately prior to the placement of concrete reinforcement. Trim bottoms to required lines and grades to leave compacted base to receive other work.
 - 2. Excavation for Underground Structures, Manholes, Drainage, Mechanical or Electrical Appurtenances, and Similar Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1.2 inches (30 mm). Do not disturb bottom of excavations intended for bearing surface.

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3.05 EXCAVATION FOR WALKS AND PAVEMENTS

- A. Excavate surfaces under walks and pavements to indicated cross sections, elevations, and grades.

3.06 EXCAVATION FOR PIPELINE AND UTILITY TRENCHES

- A. All excavation should be constructed in accordance with OSHA and CAL-OSHA Safety Standards. Safety in and around utility trench is the responsibility of the underground contractors.
- B. Excavate trenches to indicated slopes, lines, depths, and invert elevations.
- C. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit, unless otherwise indicated.
 - 1. Clearance: A minimum of 6 inches (150 mm) each side of pipe or conduit.
- D. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.
 - 1. For pipes and conduit 1 inches (100 mm) or larger in nominal diameter and for multiple conduit ductbanks, place and compact sand bedding as shown on the plans, shape bedding to provide support to a minimum of 180 degrees of pipe circumference. Fill depressions with tamped sand backfill.
 - 2. Where rock or another unyielding bearing surface is encountered, extend trench excavation a minimum of 6 inches (150 mm) below outside of conduit barrel or pipe bell to receive bedding course.
- E. Daily Limits: The Contractor shall excavate only that length of trench in which he can safely and properly install pipe and backfill daily. No trenches may be left open when the Contractor is not actively prosecuting work related to that trench. To facilitate the prosecution of the work, the Contractor may request to use plates to cover open trenches. The use of steel plates shall be dependent upon the prior approval of the Engineer. Contractor will be responsible for the maintenance and cost associated with the steel plates.
- F. Excess Material: Contractor is responsible for handling, transporting and removing excess spoil generated from trenching activities. Disposal of Waste Material shall be in accordance with Section 31 10 00 Site Clearing and Demolition, Part 3.02 Disposal of Waste Material.

3.07 APPROVAL OF SUBGRADE

- A. Notify Owner's representative when excavations have reached required subgrade.
- B. When Owner's representative determines that unforeseen unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
 - 1. Unforeseen additional excavation and replacement material will be paid according to the Contract provisions for Changes in Work.

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- C. Reconstruct subgrades damaged by rain, accumulated water, or construction activities, as directed by the Owner's representative.

3.08 UNAUTHORIZED EXCAVATION

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

3.09 STORAGE OF SOIL MATERIALS

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

3.10 BACKFILL

- A. Backfill excavations promptly, but not before completing the following:
 - 1. Acceptance of construction below finish grade including, where applicable, damp-proofing, waterproofing, and perimeter insulation.
 - 2. Surveying locations of underground utilities for record documents.
 - 3. Testing, inspecting, and approval of underground utilities.
 - 4. Concrete formwork removal.
 - 5. Removal of trash and debris from excavation.
- B. Controlled Low Strength Material (CLSM)
 - 1. Controlled low strength material shall be 1-sack cement sand slurry with a slump of 7 to 9 inches and a 28 day unconfined compressive strength of 50 to 150 psi. CLSM shall be mixed in a transit mixer. Certification tickets shall be submitted at the request of the Engineer. Where CLSM2 is called for by the Engineer, a 2-sack cement sand slurry shall be provided by the contractor.

3.11 PIPELINE AND UTILITY TRENCH BACKFILL

- A. Place and compact bedding course on unyielding bearing surfaces. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

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- B. Where trenches that carry below or pass under footings and that are excavated within 18 inches (450 mm) of footings, backfill the trench in the manner shown on the foundation plans or as directed by the Structural Engineer. If concrete backfill is permitted, place concrete to level of bottom of footings.
- C. Provide 4 inch (100 mm) thick concrete base slab support for piping or conduit less than 30 inches (750 mm) below surface of roadways or in other areas where loading from vehicular traffic is indicated on the plans. After installation and testing, completely encase piping or conduit in a minimum of 4 inches (100 mm) of concrete before backfilling or placing roadway subbase.
- D. Place and compact initial backfill of sand conforming to 3.15 - Compaction above over the pipe or utility conduit.
 - 1. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of pipe or utility conduit to avoid damage or displacement of the pipe or utility system.
- E. Coordinate backfilling with testing of the pipeline or utility.
- F. Fill voids with approved backfill materials as shoring and bracing, and sheeting is removed.
- G. Place and compact final backfill of satisfactory soil material to final subgrade.
- H. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

3.12 SUBSURFACE DRAINAGE BACKFILL

- A. Subsurface Drain: Place a layer of filter fabric around perimeter of drainage trench or at footing, as indicated. Place a 6 inch (150 mm) compacted course of filtering material on filter fabric to support drainage pipe. After installing and testing, encase drainage pipe in a minimum of 6 inches (150 mm) of compacted filtering material and wrap in filter fabric, overlapping edges at least 6 inches (150 mm).
- B. Drainage Backfill: Place and compact drainage backfill of filtering material over subsurface drain, in width indicated, to within 12 inches (300 mm) of final subgrade. Overlay drainage back fill with one layer of filter fabric, overlapping edges at least 6 inches (150 mm).
- C. Impervious Fill: Place and compact impervious fill material over drainage backfill to final subgrade.

3.13 FILL

- A. Placement of all engineered fill shall be placed on prepared subgrade in the manner approved by the Owner's Geotechnical Engineer. In general, fill material shall be placed in lifts not to exceed 8-inches in uncompacted thickness and shall be compacted by mechanical means only. Due to equipment limitations, thinner lifts may be necessary to achieve the recommended level of compaction. Engineered fill shall be moisture conditioned to within 2-percent of optimum moisture value and compacted per recommendations.

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EXCAVATION AND FILL

- B. Preparation: Remove vegetation, topsoil, debris, wet, and unsatisfactory soil materials, obstructions, and deleterious materials from ground surface prior to placing fills.
 - 1. If fill is placed on existing slopes greater than 4 to 1, Contractor shall construct keyways in undisturbed soil in accordance to Owner's Geotechnical Engineer's recommendations. At a minimum, keyways shall be on a sloped surface steeper than 1 vertical to 4 horizontal so fill material will bond with existing surface.
- C. Subgrade in areas to receive engineered fill, concrete slabs-on-grade, or pavements shall be scarified, moisture-conditioned, and recompacted in accordance with the recommendations of the Soils Report.
- D. Place fill material in layers to required elevations for each location listed below.
 - 1. Under grass, use satisfactory excavated or borrow soil material.
 - 2. Under walks and pavements, use subbase or base material, or satisfactory excavated or borrow soil material.
 - 3. Under steps and ramps, use subbase material.
 - 4. Adjacent to footings and foundations, use engineered fill.

3.14 MOISTURE CONTROL

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

3.15 COMPACTION

- A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
- C. Percentage of Maximum Dry Density Requirements: Except where specifically indicated otherwise on the plans, compact soil subgrade to not less than the following percentages of maximum dry density according to ASTM D1557:
 - 1. Under structures, building slabs, steps, compact the top 6 inches (300 mm) below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
 - 2. Under pavement and walkways, compact the top 6 inches (150 mm) below subgrade and each layer of backfill or fill material at 95 percent maximum dry density.
 - 3. Under lawn or unpaved areas, compact the top 6 inches (150 mm) below subgrade and each layer of backfill or fill material at 90 percent maximum dry density.

3.16 GRADING

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EXCAVATION AND FILL

- A. General: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between existing adjacent grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to conform to required surface tolerances.

3.17 SUBBASE AND BASE COURSES

- A. Under pavements and walks, place subbase course material on prepared subgrades. Place base course material over subbase to pavements.
 - 1. Compact subbase and base courses at optimum moisture content to required grades, lines, cross sections and thickness to not less than 95 percent of ASTM D4254 relative density.
 - 2. Shape subbase and base to required crown elevations and cross-slope grades.
 - 3. When thickness of compacted subbase or base course is 6 inches (150 mm) or less, place materials in a single layer.
 - 4. When thickness of compacted subbase or base course exceeds 6 inches (150 mm), place materials in equal layers, with no layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick when compacted.

3.18 DRAINAGE FILL

- A. Under slabs-on-grade, place drainage fill course on prepared subgrade.
 - 1. Compact drainage fill to required cross sections and thickness.
 - 2. When compacted thickness of drainage fill is 6 inches (150 mm) or less, place materials in a single layer.
 - 3. When compacted thickness of drainage fill exceeds 6 inches (150 mm) thick place materials in equal layers, with no layer more than 6 inches (150 mm) thick nor less than 3 inches (75 mm) thick when compacted.

3.19 FIELD QUALITY CONTROL

- A. Testing Agency Services: The Owner will engage a testing agency to inspect and test engineered fills, trench backfill, and compacted subgrades. Allow testing agency to inspect and test each subgrade and each fill or backfill layer. Do not proceed until test results for previously completed work verify compliance with requirements.
 - 1. Trench Backfill: In each compacted initial and final backfill layer, testing agency will perform at least one field in-place density test for each 150 feet (45 m) or less of trench, but no fewer than two tests.
- B. When testing agency reports that subgrades, fills, or backfills are below specified density, scarify and moisten or aerate, or remove and replace soil to the depth required, recompact and retest until required density is obtained.

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EXCAVATION AND FILL

3.20 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, ponding and erosion. Keep free of trash and debris.
- B. Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace material to depth directed by the Owner's representative; reshape and recompact at optimum moisture content to the required density.
- C. Settling: Where settling occurs during the Project correction period, remove finished surfacing, backfill with additional approved material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work.
- D. Survey Control Points: Protect benchmarks and horizontal control points from damage or displacement.
- E. Dust Control: Apply water or non-asphaltic dust palliative as required to maintain dust control during the course of construction operations.

3.21 STOCKPILING OF TOPSOIL

- A. Stockpile stripped or excavated soil materials topsoil at the location indicated on the plans or as directed by the Owner's representative. Excess excavated soil material to be removed from the per 3.22 Disposal of Soil below.

3.22 DISPOSAL OF SOIL

- A. Disposal of Unsuitable Soil and Waste Material generated during Site & Landscape Improvement Project: Remove unsatisfactory soil and waste material, including trash and debris, and dispose of it in accordance with CALTRANS Standard Specifications, Section 7-1.13, "Disposal of Materials Outside the Highway Right of Way.

END OF SECTION

SECTION 02230

SITE CLEARING & DEMOLITION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. General provisions of the Contract, including General and Supplementary Conditions.
- B. Civil drawings
- C. CALTRANS Standard Specifications, Section 7-1.13

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Protection of existing improvements indicated to remain.
 - 2. Protection of existing improvements adjacent to the job site.
 - 3. Pothole existing utilities with Scotts Valley Drive to confirm propose pipe routing

1.03 PROJECT CONDITIONS

- A. Traffic: No closure or obstruction of streets or other occupied or used facilities will be allowed without expressed written permission of SVWD staff, SVWD's representative and other authorities having jurisdiction over the site.
- B. Protection of Existing Improvements: The Contractor is hereby advised that certain facilities may exist within the limits of work. Such facilities may include but are not limited to, existing water works, sanitary sewerage, storm drainage, natural gas, electric, telephone, irrigation lines, cable TV, asphalt and concrete flat work and buildings. The Contractor shall at all times protect those facilities not indicated to be removed, whether or not shown to be protected, and shall remove only those facilities indicated to be removed in accordance with the Contract Documents and the direction of the authorized representative of the owner of the facility. Where the existing facilities interfere with the Contractor in the performance of his work under the Contract, the Contractor shall bear full responsibility for the location, protection, and relocation or restoration of such facility, in accordance with the requirements of the owner of such facility.
- C. Contractor shall notify Underground Service Alert (USA) at (800) 227-2600 at least five working days prior to beginning removals or excavation.
- D. **Contractor shall coordinate field installation of scope of work with field location of utilities identified by Contractor during field survey of utilities.**
- E. **Once USA locating has occurred, Contractor shall pothole utilities within the routing of the proposed water main to confirm elevations of existing utilities and their relationship to new utilities identified in the Civil Plans.**
- F. The presence of such facilities shown on the Civil Drawings and provided for in the Contract Documents is for the convenience of the Contractor in preparing his proposal and planning his work and is prepared from the best information available to the Engineer at the time of preparation. The Owner makes no warranty, expressed or implied, as to the adequacy,

SECTION 02230

SITE CLEARING & DEMOLITION

completeness, and accuracy of such information. The Contractor shall satisfy himself with regard to the existence of such facilities and their impact on his operation. Should the Contractor discover any apparent discrepancy between the Contract Documents and conditions found in the field, he shall immediately bring such discovery to the attention of the Engineer or SVWD representative. The bidder shall include in his proposal a sum to cover the cost of all items necessary to perform the work as set forth in the Contract Documents. No allowance of any kind whatsoever will be made to the Contractor because of lack of such examination or knowledge. The submission of a proposal will be considered conclusive evidence that the Contractor has made such an examination.

- G. The Contractor shall protect all public and private property, insofar as it may be endangered by his operations and take every reasonable precaution to avoid damage to such property. The Contractor shall restore and bear the cost of any public or private improvement, facility, or structure within the limits of work, within adjacent street rights-of-way, easements, or work area which is damaged or injured directly or indirectly by or on account of any act, omission, or neglect in the execution of work. This is intended to address those facilities not designated for removal but visibly evident, correctly shown on the plans, marked by the Owner or by owner of said improvement, facility, or structure. Said marking shall include any markings made by USA (Underground Service Alert).
 - 1. In restoring any damaged or injured improvement, facility, or structure, the Contractor shall restore it to a condition substantially equivalent to, or better than, that existing before such damage occurred.

1.04 EXISTING SERVICES

- A. General: Indicated locations are approximate; determine exact location before commencing work, See Section 1.03.
- B. Existing Utility System: The existing utility systems (sanitary, water, storm, gas, electric, telecommunication, and data) shall remain in service while the new utility systems are being installed. Existing laterals from the existing and proposed buildings will be disconnected, and reconnected to the new utility systems once the new systems have been installed, tested, and backfilled.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.01 SITE CLEARING

- A. General: Remove trees, shrubs, grass and other vegetation, improvements, or obstructions, as required to permit installation of new utilities or as directed by the representative of the Owner. Remove similar items elsewhere on site or premises specifically indicated. Removal includes digging out and off-site disposal of stumps and roots in accordance with CALTRANS Standard Specifications, Section 7-1.13.

SECTION 33 3100

SANITARY SEWER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Civil Drawings
- B. Drawings, general provisions of Contract Agreement Form including Appendices and Exhibits, Division 1 Specification Sections, and California Building Code, Title 24, Part 2 and appropriate sections for educational facilities apply to this Section.

1.2 SUMMARY

- A. This section includes the following:
 - 1. Sanitary sewerage.

1.3 PAYMENT OF INSTALLATION

- A. Sewerage Piping: The bidder shall include in his proposal a sum to cover all System of sewer pipe, fittings, and appurtenances for gravity flow of sanitary sewage as set forth in the Contract Documents.

1.4 PERFORMANCE REQUIREMENTS

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

1.5 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for the following:
 - 1. Polymer-concrete, channel drainage systems.
 - 2. Plastic, channel drainage systems.
 - 3. Identification materials and devices.
 - 4. Steel casing pipe and welder certification in accordance with AWWA C206
 - 5. Clean-out lid, frame and cover
- C. Reports and calculations for design mixes for each class of cast-in-place concrete.
- D. Coordination drawings showing manholes and other structures, pipe sizes, locations, and elevations. Include details of underground structures and connections. Show other piping in same trench and clearances from sewerage system piping. Indicate interface and spatial relationship between piping and proximate structures.

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SANITARY SEWER

- E. Inspection and test reports specified in the "Field Quality Control" Article.

1.6 QUALITY ASSURANCE

- A. Environmental Agency Compliance: Comply with regulations pertaining to sanitary sewerage and storm drainage systems.
- B. Utility Compliance: Comply with regulations pertaining to sanitary sewerage and storm drainage systems. Include standards of water and other utilities where appropriate.
- C. Safety Standards: All excavation should be constructed in accordance with OSHA and CAL-OSHA Safety Standards. Safety in and around utility trench is the responsibility of the underground contractors.
- D. Product Options: Drawings indicate sizes, profiles, connections, and dimensional requirements of system components and are based on specific manufacturer types indicated. Other manufacturers' products with equal performance characteristics may be considered. Refer to Division 1 Section "Product Substitutions."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic structures in direct sunlight.
- B. Do not store plastic pipe or fittings in direct sunlight.
- C. Protect pipe, pipe fittings, and seals from dirt and damage.
- D. Handle precast concrete manholes and other structures according to manufacturer's rigging instructions.

1.8 PROJECT CONDITIONS

- A. Notify Underground Service Alert (USA) at (800) 642-2444 for location and verification of existing utility locations.
- B. Locate existing structures and piping before starting construction. Verify that sanitary system piping may be installed in compliance with design and no underground conflicts exist that were not shown on the plans.
- C. Existing Utilities: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted under the following conditions and then only after arranging to provide acceptable temporary utility services.
 - 1. Notify Construction Manager not less than 48 hours in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without receiving Construction Manager's written permission

SECTION 33 3100

SANITARY SEWER

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate with existing building sewer drainage lateral (Building has been demolished) and connect piping as otherwise indicated on the plans.
- B. Coordinate with other utility work (storm, water, gas, electric and data).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
 - 1. Cleanouts, and Drains:
 - a. Ancon, Inc
 - b. Christy, Inc.
 - c. Jones Manufacturing Co., Inc.
 - d. Josam Co.
 - e. Rockford Sanitary Systems, Inc.
 - f. Jay R. Smith Mfg. Co. Div., Smith Industries, Inc.
 - g. Wade Div., Tyler Corp.
 - h. Zurn Industries, Inc., Hydromechanics Div.

2.2 PIPES AND FITTINGS

- A. Polyvinyl Chloride (PVC) Sewer Pipe and Fittings: ASTM F 679, T-1 wall thickness, bell and spigot for gasketed joints.
 - 1. Gaskets: ASTM F 477, elastomeric seal.
- B. Polyvinyl Chloride (PVC), Profile, Gravity Sewer Pipe and Fittings: ASTM F 794, open and closed profile, bell and spigot for gasketed joints.
 - 1. Gaskets: ASTM F 477, elastomeric seal to form watertight joints.
- C. Polyvinyl Chloride (PVC), Ribbed Drain Pipe: AASHTO M 304M, bell and spigot, with smooth waterway for bell-gasketed joints.
 - 1. Fittings: AASHTO M 304M or ASTM F 794 for bell-gasketed joints.
 - 2. Gaskets: ASTM F 477, elastomeric seal to form soiltight joints.
- D. Polyvinyl Chloride (PVC), Ribbed Drain Pipe: AASHTO M 304M, bell and spigot, with smooth waterway for bell-gasketed joints.
 - 1. Fittings: AASHTO M 304M or ASTM F 794 for bell-gasketed joints.
 - 2. Gaskets: ASTM F 477, elastomeric seal to form soiltight joints.
 - 3.

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2.3 SPECIAL PIPE COUPLINGS AND FITTINGS

- A. Sleeve-Type Pipe Couplings: Rubber or elastomeric sleeve and band assembly fabricated to match outside diameters of pipes to be joined, for nonpressure joints.
 - 1. Gaskets for Concrete Pipe: ASTM C443 (ASTM C443M), rubber.
 - 2. Gaskets for Cast-iron Soil Pipe: ASTM C564, rubber.
 - 3. Gaskets for Plastic Pipe: ASTM F 477, elastomeric seal.
 - 4. Gaskets for Dissimilar Pipes: Compatible with pipe materials being joined.
- B. Gasket-Type Pipe Couplings: Rubber or elastomeric compression gasket, made to match outside diameter of smaller pipe and inside diameter or hub of adjoining larger pipe, for non-pressure joints
 - 1. Gaskets for Concrete Pipe: ASTM C443 (ASTM C443M), rubber.
 - 2. Gaskets for Cast-iron Soil Pipe: ASTM C564, rubber.
 - 3. Gaskets for Plastic Pipe: ASTM F 477, elastomeric seal.
 - 4. Gaskets for Dissimilar Pipes: Compatible with pipe materials being joined.
- C. Internal, Expansion-Type Pipe Couplings: Stainless-steel expansion band with ethylene-propylene-diene-monomer (EPDM), rubber-compound sealing sleeve, made to match inside diameter of pipes for non-pressure joints. Use nitrile rubber-compound sealing sleeve for fluids containing oil or gasoline.

2.4 CONCRETE

- A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:
 - 1. Cement: ASTM C150, Type 11.
 - 2. Fine Aggregate: ASTM C33, sand.
 - 3. Coarse Aggregate: ASTM C33, crushed gravel.
 - 4. Water: Potable.
- B. Structures: Portland-cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cement ratio.
 - 1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
 - 2. Reinforcement Bars: ASTM A 615, Grade 60 (ASTM A 615M, Grade 400), deformed steel.
- C. Structure Channels and Benches: Factory or field formed from concrete. Portland-cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cement ratio.
 - 1. Include channels and benches in manholes.
 - 2. Include channels and benches in sanitary sewerage manholes.
 - 3. Include channels and benches in sanitary sewerage and combined sanitary sewerage and storm drainage manholes.
 - a. Manhole Channels: Concrete invert, formed to same width as connected piping, with height of the vertical sides to 3/4 of the pipe diameter. Form curved channels with smooth, uniform radius and slope.
 - 1) Invert Slope: 1.2 inches (30 mm) through manhole.
 - 2) Invert Slope: 2.5 percent (1:40) through manhole.
 - 3) Invert Slope: None.

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2.5 CLEANOUTS

- A. Description: ASME A1 12.36.2M, round, cast-iron housing with clamping device and round, secured, scoriated, cast-iron cover. Include cast-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.
- B. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, service class, cast-iron soil pipe and fittings.

2.7 TRENCHING

- A. See Section 31 23 00 - Excavation and Fill, for Pipeline and Utility Trenches for instructions.

PART 3 - EXECUTION

3.1 EARTHWORK

- A. Excavating, trenching, and backfilling are specified in Section 31 23 00 - "Excavation and Fill."

3.2 IDENTIFICATION

- A. Materials and their installation are specified in Section 31 23 00 - "Excavation and Fill." Arrange for installation of green warning tapes directly over piping and at outside edges of underground structures.
 - 1. Use warning tapes or detectable warning tape over Sanitary Pipe from building to grease trap.

3.3 ON-SITE SEWERAGE PIPING APPLICATIONS

- A. General: Include watertight joints.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to the following applications.
- C. Pipe Sizes 4 and 6 Inches (100 and 150 mm): ASTM D3034, polyvinyl chloride (PVC) sewer pipe and fittings; solvent-cemented joints; or with gaskets and gasketed joints.

3.4 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Drawings (plans and details) indicate the general location and arrangement of underground sewerage systems piping. Location and

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arrangement of piping layout take into account many design considerations. Install piping as indicated, to extent practical.

- B. Install piping beginning at low point of systems, 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 recommendations 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. Reduction of the size of piping in the direction of flow is prohibited.
- D. Install gravity-flow-systems piping at constant slope between points and elevations indicated. Install straight piping runs at constant slope, not less than that specified, where slope is not indicated.
- E. Install sewerage piping pitched down in direction of flow, at minimum slope of 2 percent (1:50) and 36 inch (915 mm) minimum cover, except where otherwise indicated.

3.5 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to the following.
- B. Polyvinyl Chloride (PVC) Plastic Pipe and Fittings: As follows:
 - 1. Join solvent-cement-joint pipe and fittings with solvent cement according to ASTM D2855 and ASTM F 402.
 - 2. Join pipe and gasketed fittings with elastomeric seals according to ASTM D2321.
 - 3. Join profile sewer pipe and gasketed fittings with elastomeric seals according to ASTM D2321 and manufacturer's written instruction. Install according to ASTM D2321.
- C. System Piping Joints: Make joints using system manufacturer's couplings, except where otherwise specified.
- D. Join piping made of different materials or dimensions with couplings made for this application. Use couplings that are compatible with and fit both systems' materials and dimensions.

3.6 CLEANOUT INSTALLATION

- A. 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.
- B. Set cleanout frames and covers in earth in a cast-in-place concrete block, 18 by 18 by 12 inches (450 by 450 by 300 mm) deep. Set with tops 1 inch (25 mm) above surrounding earth grade.
- C. Set cleanout frames and covers in concrete paving with tops flush with surface of paving.
- D. Set drain frames and covers with tops flush with surface of paving.

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3.7 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as the work progresses. Maintain swab or drag in piping and pull past each joint as it is completed.
 - 1. In large, accessible piping, brushes and brooms may be used for cleaning.
 - 2. Place plug in end of incomplete piping at end of day and whenever work stops.
 - 3. Flush piping between manholes and other structures, if required by authorities having jurisdiction, to remove collected debris.
- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (600 mm) of backfill is in place, and again at completion of the Project.
 - 1. Submit separate reports for each system inspection.
 - 2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of a ball or cylinder of a size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 - d. Infiltration: Water leakage into piping.
 - e. Exfiltration: Water leakage from or around piping.
 - 3. Replace defective piping using new materials and repeat inspections until defects are within allowances specified.
 - 4. Reinspect and repeat procedure until results are satisfactory.
- C. Test new on-site piping systems and parts of existing systems that have been altered, extended, or repaired for leaks and defects.
 - 1. Do not enclose, cover, or put into service before inspection and approval.
 - 2. Test completed piping systems according to authorities having jurisdiction.
 - 3. Schedule tests, and their inspections by authorities having jurisdiction, with at least 24 hours' advance notice.
 - 4. Submit separate reports for each test.
 - 5. Where authorities having jurisdiction do not have published procedures, perform tests as follows:
 - a. Sanitary Sewerage: Perform hydrostatic test.
 - 1) Allowable leakage is a maximum of 50 gallons per inch (4.6 L per mm dimension) nominal pipe size, for every mile (km) of pipe, during a 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.
 - a) Option: Test ductile-iron piping according to AWWA C600, Section 4 "Hydrostatic Testing." Use test pressure of at least 10 psig (69.0 kPa).
 - 6) Manholes: Perform hydraulic test according to ASTM C969 (ASTM C969M).
 - 7) Leaks and loss in test pressure constitute defects that must be repaired.
 - 8) Replace leaking piping using new materials and repeat testing until leakage is within allowances specified.

END OF SECTION

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STORM DRAINAGE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Civil drawings
- B. General provisions of Contract Agreement form, including appendices and exhibits.
- C. Section 31 2300 – “Excavation and Fill”.

1.2 PAYMENT

- A. This section includes the following:
 - 1. Storm Piping: The bidder shall include in his proposal a sum to cover all System of storm pipe, fittings, structures and appurtenances for gravity flow of storm water as set forth in the Contract Documents

1.3 DEFINITIONS

- A. Drainage Piping: System of pipe, fittings, and appurtenances for gravity flow of storm water.
 - 1. Storm Drains: The primary drainage conduit system conveying storm water runoff from catch basins to storm water ponds or other points of release.
 - 2. Area Drains: A secondary system of drainage conduits conveying storm water collected from building roof drains and local area drain basins to the primary storm drain system.
- B. Sewerage Piping: System of sewer pipe, fittings, and appurtenances for collection of wastewater and for its conveyance by gravity flow to public sanitary sewage systems.
- C. Bedding: Shall be the material placed to a minimum depth of 4-inches (102-mm) below and 12-inches above all storm and sewer piping and structures.
- D. Backfill: Shall be that material used to fill trenches and excavated areas above the depth of the bedding.
- E. Softscape: Landscape areas planted with vegetation (pervious).
- F. Hardscape: Areas paved or intended for foot travel (impervious).

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for the following:
 - 1. Drop inlets, area drain boxes and in-line drain boxes.

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- C. Shop drawings for precast concrete manholes and other structures. Include frames, covers, and grates.
- D. Shop drawings for cast-in-place concrete manholes and other cast-in-place structures.
 - 1. Shop drawings for area drains, including frames, covers, and grate.
 - 2. Certificate of compliance for utility bedding (sewer, area drains, and storm drains).
 - 3. Certificate of compliance for backfill bedding (sewer, area drains, and storm drains).

1.5 QUALITY ASSURANCE

- A. Product Options: Drawings indicate sizes, profiles, connections, and dimensional requirements of system components and are based on specific manufacturer types indicated. Other manufacturers' products with similar performance characteristics may be considered.
- B. Safety Standards: All excavation should be constructed in accordance with OSHA and CAL-OSHA Safety Standards. Safety in and around utility trench is the responsibility of the underground contractors.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic structures in direct sunlight.
- B. Do not store plastic pipe or fittings in direct sunlight.
- C. Protect pipe, pipe fittings, and seals from dirt and damage.
- D. Handle precast concrete manholes and other structures according to manufacturer's rigging instructions.
- E. Properly support pipe during transport, handling, and storage. Maintain bracing and chocking in place until pipe is ready for installation.

1.7 PROJECT CONDITIONS

- A. Notify Underground Service Alert (USA) at (800) 227-2600 for location and verification of existing utility locations.
- B. Locate existing structures and piping to be closed and abandoned. Verify that storm drain system piping may be installed in compliance with design and no underground conflicts exist that were not shown on the plans.
- C. Existing Utility System: Do not interrupt existing utilities serving facilities occupied by the Owner or others except when permitted under the following conditions and then only after arranging to provide acceptable temporary utility services.
 - 1. Notify Owner not less than 48 hours in advance of proposed utility interruptions.
 - 2. Do not proceed with utility interruptions without receiving Owner's written permission.

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- D. Site Information: See Section 31 1000 Site Clearing, Part 1.03 Project Conditions, for description of existing topographic and utility information.

1.8 SEQUENCING AND SCHEDULING

- A. Notify Owner's representatives a minimum of two working days in advance of proposed storm sewer interruptions.
- B. Coordinate with other pipeline and utility work (gas, electric conduits, water, fire suppression, communications conduits, etc.)

PART 2 - PRODUCTS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following for the entire project or approved substitute:
 - 1. Drop Inlets, Trench Drains and Drain Boxes:
 - a. Christy Concrete Products Inc.
 - b. Hanson Concrete Products Inc.
 - c. Santa Rosa Products Inc.
 - d. Old Castle
 - 2. Area Drain (Inline and Drain Basins)
 - a. Nyloplast® Advanced Drainage Systems, Inc. (ADS).
 - b. Christy Concrete products
 - c. Old Castle
 - 3. Manholes:
 - a. Santa Rosa Products, Inc.
 - b. Hanson Concrete Products, Inc.
 - c. Old Castle
 - 4. Slot Drains
 - a. NDS

2.2 PIPES AND FITTINGS

- A. Polyvinyl Chloride (PVC) Sewer Pipe and Fittings: ASTM F 679, T-1 wall thickness, bell and spigot for gasketed joints.
 - 1. Gaskets: ASTM F 477, elastomeric seal.
- B. Polyvinyl Chloride (PVC), Profile, Gravity Sewer Pipe and Fittings: ASTM F 794, open and closed profile, bell and spigot for gasketed joints.
 - 1. Gaskets: ASTM F 477, elastomeric seal to form watertight joints.
- C. Polyvinyl Chloride (PVC), Ribbed Drain Pipe: AASHTO M 304M, bell and spigot, with smooth waterway for bell-gasketed joints.

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1. Fittings: AASHTO M 304M or ASTM F 794 for bell-gasketed joints.
2. Gaskets: ASTM F 477, elastomeric seal to form soiltight joints.

D. Polyvinyl Chloride (PVC), Ribbed Drain Pipe: AASHTO M 304M, bell and spigot, with smooth waterway for bell-gasketed joints.

1. Fittings: AASHTO M 304M or ASTM F 794 for bell-gasketed joints.
2. Gaskets: ASTM F 477, elastomeric seal to form soiltight joints.

E. High Density Polyethylene (HDPE), Corrugated Exterior Drain Pipe, Dual Wall, Smooth Interior: AASHTO D3212, bell and spigot, with smooth waterway for bell-gasketed joints.

1. Fittings: AASHTO M294 or ASTM F2306 for bell-gasketed joints.
2. Gaskets: ASTM F 477, elastomeric seal to form soiltight joints.

2.3 SPECIAL PIPE COUPLINGS AND FITTINGS

A. Gasket-Type Pipe Couplings: Rubber or elastomeric compression gasket, made to match outside diameter of smaller pipe and inside diameter of bell of adjoining larger pipe, for non-pressure joints.

1. Gaskets for Plastic Pipe: ASTM F477, elastomeric seal.
2. Gaskets for Dissimilar Pipes: Compatible with pipe materials being joined.

2.4 DRAIN BOXES

A. On-Site Precast drain boxes: All precast drain boxes shown on, but not limited to the civil plans. Inlets shall be precast, reinforced concrete of depth indicated.

2.5 CONCRETE

A. General: Cast-in-place concrete according to ACI 318, ACI 350R, and the following:

1. Cement: ASTM C150, Type II.
2. Fine Aggregate: ASTM C33, sand.
3. Coarse Aggregate: ASTM C33, crushed gravel.
4. Water: Potable.

B. Structures: Portland-cement design mix, 4000 psi (27.6 MPa) minimum, with 0.45 maximum water-cement ratio.

1. Reinforcement Fabric: ASTM A185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A615, Grade 60 (ASTM A615M, Grade 400), deformed steel.

C. Structure Channels and Benches: Field formed from concrete. Portland-cement design mix, 4000 psi (27.6 MPa) minimum. with 0.45 maximum water-cement ratio.

1. Include channels and benches in storm manholes.
2. Include channels and benches in sanitary sewerage manholes.
3. Include channels and benches in storm drop inlets.
 - a. Manhole Channels: Concrete invert, formed to same width as connected piping, with height of the vertical sides to 3/4 of the pipe diameter. Form curved channels

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- b. with smooth, uniform radius and slope. The radius shall be not less than 40 percent of the manhole diameter.
 - 1) Invert Slope: 2.5 percent (1:40) through manhole.
- c. Manhole Benches: Concrete, sloped to drain into channel; coarse broom finish.
 - 1) Slope: 0.5 inch per foot (1:24).
 - 2) Include channels and benches in storm drainage catch basins.
- d. Catch Basin Channels: Concrete invert, formed to same width as connected piping, with height of the vertical sides to 3/4 of the pipe diameter. Form curved channels with smooth, uniform radius and slope. The radius shall be not less than 40 percent of the manhole diameter.
 - 1) Invert Slope: match proposed slope through catch basin.
- e. Catch Basin Benches: Concrete, sloped to drain into channel
 - 1) Slope: 0.5 inch per foot (1:24).

2.6 BEDDING, AND BACKFILL

- A. Sand bedding: Bedding material shall be clean, washed, granular material derived from decomposed or crushed rock. Such material shall be free of organic material, mica, clay, silts, oils and other deleterious materials. Sand bedding shall have a maximum particle size of 1/4 - inch with gradation that allows 90 to 100 percent passing a No. 4 sieve and not more than 10 percent to pass a No. 200 sieve.
- B. Backfill:
 - 1. Pipe Zone Backfill: Backfill with sand conforming to the requirements of 2.07 A., referenced above. Backfill shall be placed 12 inches above the top of pipe and compact in accordance to 95 % Relative Compaction. Compaction shall be monitored by Owner's Geotechnical Engineer.
 - 2. Backfill above pipe zone: Sand conforming to the specification above shall be used as backfill. Native material may be used as trench backfill if approved by the Owner's Geotechnical Engineer.
 - 3. Sand/Cement Slurry Backfill: Sand/cement slurry backfill shall consist of fluid, workable mixture of aggregate, cement, and water. Aggregate for sand/cement slurry shall be clean, washed fine aggregate conforming with Section of this section. Alternatively, fine aggregate may be clean mortar sand conforming with provisions of ASTM C404.
 - a. Cement shall be Type IP.
 - b. Water shall be potable.

2.7 EXCAVATION FOR SEWER AND DRAINAGE PIPE TRENCHES

- A. Excavate trenches to indicated slopes, lines, depths, and invert elevations. See Section 31 23 00 - "Excavation and Fill".
- B. Excavate trenches to uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe, unless otherwise indicated.
 - 1. Clearance: A minimum of 4 inches (100 mm) and a maximum of 9 inches (230 mm) on each side of pipe or conduit.

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C.

- D. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove stones and sharp objects to avoid point loading.

1. For pipes or conduit less than 4 inches (100 mm) in nominal diameter, hand-excavate trench bottoms and support pipe bells and conduit on an undisturbed subgrade.
2. For pipes and conduit 4 inches (100 mm) or larger in nominal diameter, place and compact sand bedding as shown on the plans, shape bedding to provide support to a minimum of 180 degrees of pipe circumference. Fill depressions with tamped sand backfill.
3. Where rock or other unyielding bearing surface is encountered, extend trench excavation a minimum of 6 inches (150 mm) below pipe barrel and bell to receive bedding course.

2.8 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavations per Section 3.08 "Unauthorized Excavations" of Section 31 2300 – "Excavation and Fill."
- B. Where indicated widths of utility trenches are exceeded, provide remedial measures in accordance with the recommendations of the pipe manufacturer and such other measures as may be required by the Owner's representative.

2.9 COMPACTION

- A. Place backfill and fill materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.
- B. Place backfill and fill materials evenly on all sides of structures to required elevations. Place backfill and fill uniformly along the full length of each structure.
- C. Percentage of Maximum Dry Density Requirements: Compact soil shall be in compliance with the plans and details.

PART 3 - EXECUTION

3.1 IDENTIFICATION

- A. Materials and their installation are specified under Section 31 2300 – "Excavation and Fill." part 2.02 "Accessories." Arrange for installation of green warning tapes directly over piping and at outside edges of underground structures.
1. Locate warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below subgrade under pavements and slabs.

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3.2 ON-SITE DRAINAGE PIPE APPLICATIONS

- A. General: Include watertight joints.
- B. Refer to Part 2 of this Section for detailed specifications for pipe and fitting products listed below. Use pipe, fittings, and joining methods according to the following applications.
- C. Refer to Part 2 of this Section for detailed specifications for pipe trenching.
- D. Drainage Pipe Sizes 4 to 12 Inches (100 to 300 mm): AASHTO M252 Interim, corrugated, high density polyethylene (HDPE) drainage pipe and fittings; high density polyethylene (HDPE) sleeve, silt-tight couplings; and silt-tight, coupled joints in sizes 8 and 10 inches (200 and 250 mm). AASHTO M 294 Interim, corrugated, high density polyethylene (HDPE) plastic pipe and fittings; high density polyethylene (HDPE) sleeve, silt-tight couplings; and silt-tight, coupled joints in sizes 12 and 15 inches (300 and 375 mm).
- E. Drainage Pipe Sizes 12 to 48 Inches (300 to 1200 mm): AASHTO M294M corrugated, high density polyethylene (HDPE) drainage pipe; high density polyethylene (HDPE) sleeve, silt-tight couplings; and silt-tight, coupled joints in sizes 8 and 10 inches (200 and 250 mm). AASHTO M 294 Interim, corrugated, high density polyethylene (HDPE) plastic pipe and fittings; high density polyethylene (HDPE) sleeve, silt-tight couplings; and silt-tight, coupled joints in sizes 12 and 48 inches.
- F. Drainage Pipe Size 4 Inch HDPE (Perforated): Refer to Part 2.2 "Pipes and Fitting" Under item D "Perforated Pipe" this section.

3.3 INSTALLATION, GENERAL

- A. General Locations and Arrangements: Civil drawings (plans and details) indicate the location and arrangement of underground drainage systems piping.
- B. Install piping beginning at low point of systems, true to pipe laser 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 recommendations 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 manholes for changes in direction, except where fittings are indicated. Use fittings for branch connections, except where direct tap into existing sewer is indicated.
- D. Use proper size increasers, reducers, and couplings, where different sizes or materials of pipes and fittings are connected. Reduction of the size of piping in the direction of flow is prohibited.
- E. Install gravity-flow-systems piping at constant slope between points and elevations indicated using a pipe laser. Install straight piping runs at constant slope, not less than that specified, where slope is not indicated.

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- F. Install sewerage piping pitched down in direction of flow, at the lines and slopes indicated on the plans. Use a pipe laser to maintain grades.
- G. Extend drainage piping and connect to building's storm drains, of sizes and in locations indicated. Terminate piping as indicated.

3.4 PIPE JOINT CONSTRUCTION AND INSTALLATION

- A. General: Join and install pipe and fittings according to the following.
- B. Polyethylene (PE) Plastic Pipe and Fittings: As follows:
 - 1. Join pipe, tubing, and fittings with couplings for soil-tight joints according to AASHTO "Standard Specifications for Highway Bridges," Division 11, Section 26.4.2.4 "Joint Properties" and manufacturer's written instructions.
 - 2. Join pipe, tubing, and gasketed fittings with elastomeric seals for watertight joints according to ASTM D2321 and manufacturer's written instructions.
 - 3. Install according to ASTM D2321 and manufacturer's written instructions.
- C. System Piping Joints: Make joints using system manufacturer's couplings, except where otherwise specified.

3.5 TRENCH DRAIN INSTALLATION

- A. Materials: The Trench (Slot) Drain system bodies shall be manufactured from polymer concrete with minimum properties as follows:
 - Compressive strength: 14,000 psi
 - Flexural strength: 4,000 psi
 - Water absorption 0.07%
 - Frost proof
 - Salt proof
 - Dilute acid and alkali resistant

The nominal clear opening shall be 4.00" (100mm) with overall width of 6.3" (160mm). Pre-cast units shall be manufactured with an invert slope of 0.6% and have a wall thickness of at least 0.67" (16mm) Each unit will feature a full radius in the trench bottom and a male to female interconnecting end profile. Units shall have horizontal cast in anchoring features on the outside wall to ensure maximum mechanical bond to the surrounding bedding material and pavement surface. The ductile iron edge rail will be integrally cast in by the manufacturer to ensure maximum homogeneity between polymer concrete body and edge rail. Each edge rail shall be at least 1/4" (6mm) thick.

- C. Installation: The Slot Drain system shall be installed in accordance with the manufacturer's installation instructions and recommendations.

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3.6 AREA DRAIN INSTALLATION

- A. Installation per manufacturer's instructions.
- B. Set frames and grates to elevations indicated on civil plans. Set frames in concrete per manufacturer's recommendations in areas subject to traffic loading.
- C. Fasten pour ring to drains prior to backfill or pouring of Portland cement concrete.
- D. Set drain frames and covers with tops flush with surface of paving prior to pouring concrete pavement.

3.7 STORM DRAINAGE DROP INLET/ INSTALLATION

- A. Form continuous concrete channels and benches between inlets and outlet, where indicated.
- B. Set tops of frames and covers flush with finished surface where manholes occur in pavements. Set tops 3 inches (76 mm) above finished surface elsewhere, except where otherwise indicated.
- C. Place precast concrete sections as indicated, and install according to ASTM C891.
- D. The upper 18 inches (45 cm) of the inlet (immediately below finished surface) shall be poured-in-place.

3.8 CONCRETE PLACEMENT

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

3.9 DRAINAGE SYSTEM INSTALLATION

- A. Assemble and install components according to manufacturer's written instructions and as indicated.
- B. Install with top surfaces of components, except piping, flush with final finished surface.

3.10 FIELD QUALITY CONTROL

- A. Clear interior of piping and structures of dirt and superfluous material as the 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 whenever work stops.
 - 2. Flush piping between manholes and other structures to remove collected debris.

SECTION 33 4100

STORM DRAINAGE

- B. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches (600 mm) of backfill is in place, and again at completion of the Project.
1. Submit separate reports for each system inspection.
 2. Defects requiring correction include the following:
 - a. Alignment: Less than full diameter of inside of pipe is visible between structures.
 - b. Deflection: Flexible piping with deflection that prevents passage of a ball or cylinder of a size not less than 92.5 percent of piping diameter.
 - c. Crushed, broken, cracked, or otherwise damaged piping.
 3. Replace defective piping using new materials and repeat inspections until defects are within allowances specified.
 4. Re-inspect and repeat procedure until results are satisfactory.

END OF SECTION

END OF DOCUMENT

2-F ADDENDA

END OF DOCUMENT

2-G SPECIAL CONDITIONS AND LIQUIDATED DAMAGES

MODIFICATIONS TO THE GENERAL CONDITIONS

Time Allowed for Completion

Due to time constraints on completing the Project, the Contractor shall submit all required bonds and evidence of insurance within ten (10) days of the date the Contract is awarded. The Owner intends to issue a Notice to Proceed within fifteen (15) days of the date the Contract is awarded.

Substantial Completion of this Project shall be completed within Contract Period consecutive calendar days from the date established in the Notice to Proceed for the commencement of the work.

Final Completion shall occur within Contract Period consecutive calendar days from the date established in the Notice to Proceed for the commencement of the work.

Damages for Delays

For the period of time that any portion of the work remains unfinished after the time fixed for an interim milestone and/or Substantial Completion, as modified by extensions of time granted by the Owner, it is understood and agreed by the Contractor and the Owner that the Contractor shall pay the Owner the damages listed below.

	Dollars Per Day Liquidated Damages (Amount in Dollars)
Substantial Completion	\$ -----
Final Completion	\$560

SUBSTANTIAL COMPLETION

Substantial completion of the Project requires that the following portions of the Work must be completed in accordance with the requirements of the Contract Documents.

Completion of the work as required by the Contract Documents to allow the Owner to occupy and utilize the Project for its intended purpose.

Completion of the Corrective Work Item List.

All testing required by the Contract and Specifications has been successfully completed.

Final Site Clean-Up

All record drawings have been submitted, updated, reviewed and approved.

Completion of the Final Punch List prepared by the Construction Manager.

CONTRACT ADMINISTRATION

The following project representatives are hereby designated by the Owner:

Owner Representative: Nate Gillespie (NAME)

Design Consultant: Todd Creamer, C2G/Civil Consultants Group, Inc. (NAME)

Construction Manager: _____ (NAME)

All communications to and from the Contractor shall be routed through the Owner's Representative.

END OF DOCUMENT

SECTION 3 STANDARD SPECIFICATIONS

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3-A GENERAL TECHNICAL REQUIREMENTS**3-A.01 Mobilization****(A) General**

Mobilization shall include but not be limited to, all work necessary to move onto the job site all personnel, equipment, tools, and materials, establish all offices, buildings, and temporary site facilities, temporary sanitary facilities, prepare and maintain record drawings, provide emergency response, and generally prepare for construction.

(B) Project Office

The Contractor shall establish and maintain for the duration of the project, a project office located within an approximate one (1) hour drive of the project site. The project office shall be established and operational within five (5) working days of the effective date of the Notice to Proceed or prior to commencing work, whichever is the earlier.

The project office shall be equipped with electrical service; Wi-Fi service; a conference table and chairs seating not less than six (6) people; two (2) desks and a plan table each with appropriate chairs.

(C) Field Office

Where provided for in the Contract Documents, the Contractor shall establish and maintain for the duration of the project, a field office located at the project site for use of his supervisory personnel. The field office shall be equipped with electrical service; wi-fi service; a conference table and chairs seating not less than six (6) people; two (2) desks and a plan table each with appropriate chairs.

Additionally, when provided for in the Contract Documents, the Contractor shall establish and maintain for the duration of the project, a similar but separate office located adjacent to the Contractors project office for use of the Engineer's field observation personnel. The Engineer's office shall be equipped with electrical service; telephone service consisting of a minimum of a Wi-Fi connection; one (1) desk and a plan table each with appropriate chairs; and one lockable filing cabinet. The Contractor shall be solely responsible for arrangements for utility services for both offices.

The Contractor shall suitably grade an area sufficient to park not less than six (6) light trucks and/or passenger vehicles. The parking area shall be not more than 50 LF from the farthest of the two offices. The parking area and its access drive shall be surfaced with aggregate base

material, crushed rock or other appropriate material. The Contractor shall maintain the parking area to provide a stable free draining parking surface, and shall take appropriate measures to minimize dust.

The field office shall be established and operational within five (5) working days of the effective date of the notice to proceed or prior to commencing work on the project, whichever is the earlier.

(D) Bulletin Board

Where provided for in the Contract Documents, the Contractor shall install a bulletin board in a conspicuous location at the field office or on the job site for the posting of such notices as may be required by regulatory agencies. Said bulletin board shall be a minimum of 2-LF by 4-LF in size, constructed of substantial material such as plywood, mounted on posts and protected against the weather and vandalism. The Engineer shall have access to this bulletin board at all times for the posting of notices at such times as work is not in progress on the site.

(E) Record Drawings

Record drawings shall be kept on file in the project office. Record drawings shall be updated continuously throughout the course of the work. Record Drawings shall be reviewed monthly by the District Representatives to verify plans are being kept up-to-date. The District may withhold progress payment until Record drawings have been deemed current by District Representatives. Upon completion of work, the Contractor shall submit all copies of record drawings to the District in a hard copy and digital format.

(F) Emergency Response

The Contractor shall maintain an emergency telephone number and shall be able to have competent personnel to the project site within one (1) hour or that time provided for in the Contract Documents from the time a call is placed to the emergency telephone number.

(G) Measurement and Payment

Mobilization shall be considered a lump sum item. The contract lump sum price for Mobilization shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work necessary for the movement of personnel, equipment, supplies and incidentals to the project site; the establishment and maintenance of the project and Engineer's offices (including payment of regular utility charges); maintenance of record drawings; and for all other work and operations which must be performed prior to

beginning work on the various contract items on the project site. The method of establishing relative completion of this item for partial payments shall be as provided for in Section 5-A-General Conditions, "Contract Administration" of these contract documents.

3-A.02 Existing Facilities

(A) General

The Contractor is hereby advised that certain facilities may exist within the limits of work. Such facilities may include but are not limited to, existing water works, sanitary sewerage, storm drainage, traffic signals, natural gas, electric, telephone, cable television, highway structures, and buildings. The Contractor shall at all times protect those facilities not indicated to be removed, whether or not shown to be protected, and shall only remove those facilities indicated to be removed in accordance with the Contract Documents, the directions of the Engineer, and the direction of the owner of the facilities. Where the existing facility interferes with the Contractor in the performance of his work under the Contract, the Contractor shall bear full responsibility for the location, protection, and relocation or restoration of such facility, in accordance with the requirements of the owner of such facility.

The presence of such facilities shown on the Project Plans and provided for in the Contract Documents is for the convenience of the Contractor in preparing his proposal and planning his work and is prepared from the best information available to the Engineer at the time of preparation. The District makes no warranty, expressed or implied, as to the adequacy, completeness, and accuracy of such information. The Contractor shall satisfy himself with regards to the existence of such facilities and their impact on his operation.

Where such facilities are found to exist in locations other than those marked by the owner of such facilities, the Engineer may consider the Contractors request for an extension in time or additional compensation. Such compensation shall be contingent upon the Contractors conformance with the provisions of Section 5-A General Conditions "Differing Site Conditions" of these contract documents.

(B) Measurement and Payment

No separate measurement will be made for work relating to existing facilities. Payment for protecting and adjusting these facilities shall be considered as included in the contract unit or lump sum price for other items of work and no additional compensation will be allowed therefor.

3-A.03 Clearing and Grubbing**(A) General**

Work under this section shall be performed in accordance with "Existing Highway Facilities" and "Clearing & Grubbing" in the current CALTRANS Standard Specifications.

Clearing and grubbing shall consist of removing and disposing of all objectionable material from within the limits of work as defined by the Contract Documents. Objectionable material shall be that material which interferes with the prosecution of or would otherwise be detrimental to the work, including but not limited to, paving materials, trees, brush and vegetation, unsuitable soils, debris, trash, rubbish, minor structures such as sheds, shelters and fences, and all extraneous water within the work limits.

(B) Preservation of Property

The Contractor shall take precautions to protect all public and private properties and improvements not indicated to be removed including but not limited to, utilities and structures, trees, landscaping, roadways, drainage courses, and buildings encountered within or adjacent to the project limits. The Contractor shall also protect all existing facilities indicated to be removed until the Engineer deems that the function of such facilities has passed to the improvements provided for under the Contract or that such function is no longer required.

Only those trees and plants designated for removal shall be removed.

(C) Final Cleaning Up

Nothing herein shall be construed as relieving the Contractor of his responsibility for final clean-up of the project. Items which are required to be salvaged, including traffic signs and any other items so noted on the Plans, shall be carefully removed and delivered to the District. Except as otherwise provided in the Project Special Provisions, all other materials removed are the property of the Contractor and shall be disposed of by him at his expense in a manner approved by the Engineer.

Burning will not be permitted.

(D) Disposal

Surplus excavated material shall become the property of the Contractor and shall be disposed of outside the project boundary in accordance with the provisions outlined in "Disposal of Materials" in the current CALTRANS Standard Specifications.

(E) Drainage

Throughout the prosecution of the work under the Contract, the Contractor shall keep all the work areas free of all water including but not limited to, rainwater, groundwater, and leachate and shall take precautions to prevent runoff onto adjacent properties. These precautions shall include but not be limited to dikes, berms, channels, diversions, pumping equipment, and other facilities necessary to control runoff. All work areas shall be constructed or provided with proper and adequate drainage facilities to avoid trapped and/or ponded water which may cause failure of or damage to constructed improvements or adjacent properties.

(F) Measurement and Payment

The contract unit or lump sum price for Clearing and Grubbing shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work in clearing work areas, disposing of objectionable materials, and providing drainage and no additional compensation will be allowed therefor.

Any change in the quantity or extent of work to be performed under clearing and grubbing caused by the issuance of a Contract Change Order will be paid in accordance with the provisions of Section 5 Contract Administration of these contract documents.

3-A.04 Safety**(A) General**

The Contractor shall bear full responsibility for compliance with all applicable safety and health standards, rules, regulations, and orders established by the State of California Department of Occupational Safety and Health (Cal-OSHA) and the Federal Department of Occupational Safety and Health (OSHA).

In the event of an emergency, the Engineer may direct the Contractor to use other equipment, personnel, or methods when, in the opinion of the Engineer, the use of improper or insufficient personnel, materials, or methods would present a hazard to the public or expose the Districts facilities to a risk of damage. The Engineers direction shall only be in the interest of stopping unsafe practices and shall not be construed as superintendence of the Contractors forces.

(B) Safety Plan

When provided for in the Contract Documents and whenever the Contract Documents provide for extended trenching operations in excess of 5-LF in depth, the Contractor shall have prepared by an engineer registered in the State of California (hereinafter referred to as the

Safety Engineer), a Safety Plan for safety measures on the project. This Safety Plan shall include but not be limited to, the following:

- Traffic control requirements for the delivery of materials;
- Storage and handling of delivered materials, including but not limited to installation as required;
- Shoring plans for all excavations including but not limited to underground tanks, tank ventilation, retaining walls, vaults, and piping;
- Provisions for compliance with the OSHA requirements for Permit-Required Confined Spaces;
- Any other plans required for compliance with those regulatory agencies having jurisdiction over the work.

(C) Safety Inspections

The Safety Engineer for this Safety Plan shall make periodic inspections of the site and the work to ensure compliance with these requirements and to make any adjustment or revision to the original safety plan required by field conditions or the Contractor's work. A report of each inspection shall be submitted to the Engineer within one working day of the inspection. No work or element of work noted in the Safety Plan or this report shall be commenced without the approval of the Safety Engineer. Any work or condition not in compliance with these requirements shall be immediately corrected to the Safety Engineers satisfaction or suspended until such time as compliance can be met. Suspended work shall not recommence until receipt of written notice from the Safety Engineer to the Engineer that corrective action has been taken to his satisfaction.

(D) Site Investigations

The Contractor and his Safety Engineer are encouraged to perform their own site investigations to satisfy themselves as to the conditions on-site including if desired, additional subsurface investigations. No additional compensation will be considered for changed conditions that might reasonably have been foreseen by such investigation. Arrangements for site investigations may be arranged through the Engineer or the District.

(E) Measurement and Payment

When the Contract Documents provide a proposal item for Safety Plan or Trench Safety, the contract lump sum price for Safety Plan or Trench Safety shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all work in

preparing the Safety Plan, implementing the Safety Plan, constructing embankment shoring and performing safety inspections and no additional compensation will be allowed therefor.

When the Contract Documents do not provide a proposal item for Safety Plan or Trench Safety, compliance with applicable safety laws, regulations, and ordinances shall be considered as incidental to other items of work and included in the contract unit or lump sum price for such items of work and no additional compensation will be allowed therefor.

3-A.05 Traffic Control

(A) Description

The Contractor shall provide a traffic control system commensurate with public safety and the requirements of agencies having jurisdiction over the work (City of Scotts Valley or Santa Cruz County). All work shall be in accordance with the CALTRANS Manual of Traffic Controls, these Standard Specifications, and the Contract Documents. All traffic control systems shall be installed and operated in accordance with these Standard Specifications and the requirements of agencies having jurisdiction over the work. The exact spacing of elements of the traffic control plan may be adjusted to account for the field conditions as found. No elements shall be installed without the prior written approval of the Engineer.

The Contractor shall perform all traffic control measures required by the Contract Documents, encroachment permits, and as directed by the Engineer as provided for elsewhere herein. When provided for in the Contract Documents, the Contractor shall prepare a Traffic Control Plan that delineates the traffic control measures anticipated by the Contractor, those required by agencies having jurisdiction over the work area, and any special provisions cited in the Contract Documents.

(B) Traffic Control System

In general, the traffic control system used shall be in general conformance with the provisions of Standard Plan No. T12, "Traffic control system for lane closure on multilane conventional highways" and Standard Plan No. T13, "Traffic control system for lane closure on two lane conventional highways" of the current CALTRANS Standard Specifications. Specific placement of all signs, barricades, cones, delineators, and flaggers shall be adjusted to reflect conditions found in the field while maintaining the intent of such standard plans.

When provided for in the Contract Documents, the Contractor shall have a Traffic Safety Plan prepared by an engineer registered in the State of California as a Traffic Engineer.

Throughout the term of the contract, the Contractor shall maintain all traffic control measures, including but not limited to, construction area signs, flaggers, cones and delineators, and other measures required by the Contract Documents, encroachment permits, the Traffic Engineer, and the Engineer as provided for elsewhere in these Standard Specifications.

The Contractor shall maintain all traffic control equipment and procedures in good working order throughout the life of the contract and shall promptly repair or replace any elements of the traffic control plan damaged or displaced during construction, due to any cause, at the direction of the Engineer.

(C) Encroachment Permit Requirements

All work on public rights-of-way shall be subject to the Encroachment Permit conditions of the Agencies of jurisdiction. The Contractor shall be thoroughly familiar with such permit conditions in preparing his proposal. Throughout the Contract, the Contractor shall comply with all requirements and conditions of such permits regarding traffic control in and around the limits of work.

(D) Construction Area Signs

(1) Description - Construction area signs shall include all temporary signs necessary for the control of traffic through or around the work area, including both stationary mounted and portable signs as defined herein. The Engineer shall make the sole determination of what type of sign or signs may be used for construction traffic control.

(2) Stationary-Mounted Signs - Stationary-mounted signs shall be installed on wood posts in general conformance with Standard Plan No. T12, "Traffic control system for lane closure on multilane conventional highways" and Standard Plan No. T13 "Traffic control system for lane closure on two lane conventional highways" of the current CALTRANS Standard Specifications. The exact spacing of stationary-mounted signs shall be adjusted as required by field conditions agencies having jurisdiction over the work areas. All elements of the traffic control system shall be shown on the traffic control plan.

All stationary-mounted signs shall be constructed of sheet aluminum base material not less than 0.063-inch thick. Reflective sheeting shall meet current CALTRANS Standard Specifications for Reflective Sheeting Aluminum Signs. Used signs may be considered satisfactory if the sheeting has not deteriorated due to weathering, vandalism, or other causes that impair visibility or legibility. The colors of reflective sheeting shall be in accordance with the Manual of Traffic Controls, and shall not have faded to the point where there is a discernible difference between the daytime and nighttime when viewed under vehicle headlamps on low-beam.

Legends may be applied by the screening process or by the use of pressure sensitive cut-out sheeting. Size and spacing of letters and symbols shall be in accordance with CALTRANS sign specifications sheets available from the CALTRANS Central Office of Business Management.

(3) Portable Signs - Portable signs shall be 3 types; rigid, flexible, and flashing.

(a) Rigid Portable Signs

Rigid portable signs shall be in accordance with [Section 3-A.05, "Traffic Control" \(2\) Stationary-Mounted Signs](#) of these Standard Specifications and mounted on portable folding or non-folding barricades, Type I, II, or III in accordance with the "Manual of Traffic Controls" published by the CALTRANS. Rigid portable signs may be permitted by the Engineer as a substitute for stationary-mounted signs where, in the opinion of the Engineer, use of stationary-mounted signs would be impracticable due to field conditions. When rigid portable signs are substituted for stationary-mounted signs, only Type III barricades shall be used and they shall be counterweighted with a sufficient number of sandbags to prevent their displacement. The Contractor may submit an alternative design for a substitute to the stationary-mounted sign but shall not install such substitute without the written approval of the Engineer. The Contractor shall not substitute portable, rigid signs for stationary-mounted signs without the express written direction of the Engineer unless such substitution is provided for in the Contract Documents.

As required by field conditions, the rigid portable barricades shall be counterweighted with a sufficient number of sandbags or other weights to prevent displacement or overturning due to weather and traffic conditions found in the field.

Solid materials such as concrete masonry units, concrete debris or other materials that could become a hazard if struck by traffic shall not be used to ballast portable barricades.

(b) Flexible Portable Signs

Flexible portable signs shall be fabricated from cotton drill, flexible industrial nylon mesh fabric, or other fabric material approved by the Engineer. Size, legend, and color shall be in accordance with [Section 3-A 05, "Traffic Control" \(2\) Stationary-Mounted Signs](#) of these Standard Specifications.

Flexible, portable signs shall be mounted on commercially fabricated stands approved by the Engineer. Such stands shall position the sign a minimum of 5-LF above the roadway surface and shall be so constructed as to withstand displacement or upset due to wind or traffic activity. If

necessary, the base of the stand shall be counter-weighted by a sufficient number of sandbags or other weights to ensure stability in the weather and traffic conditions found in the field.

Solid materials such as concrete masonry units, concrete debris or other materials that could become a hazard if struck by traffic shall not be used to ballast portable signs.

Flexible, portable signs shall only be used for daily operations and shall not be used to control traffic during periods when the Contractor has ceased operations for the day.

(c) Flashing Arrow and Message Boards

Flashing arrow and message boards shall be used to enhance the conveyance of traffic control information to drivers approaching the work areas. Each flashing arrow or message board shall be in accordance with the provisions of "Flashing Arrow Signs" of the CALTRANS Standard Specifications and "Lighting Devices" of the "Manual of Traffic Controls" published by CALTRANS.

(4) Traffic Cones, Portable Delineators, and Portable Barricades - Wherever required by the Contract Documents, the Traffic Control Plan, or the Engineer, the Contractor shall provide cones, delineators, or portable barricades to define the work areas.

(a) Traffic Cones and Delineators

Traffic cones and portable delineators shall be fabricated from highly pigmented fluorescent orange polyvinyl material.

The base of each traffic cone shall be integral to the top. The base may be orange or black in color and shall be of sufficient weight to minimize displacement or overturning due to either or traffic conditions found on site. Additional weight may be added by sand bags or other low profile, pliable material. The overall height of the cone shall be at least 28 inches with a minimum bottom inside diameter of 10.5 inches. Traffic cones shall be capable of direct or glancing impact from a vehicle without damage to either the vehicle or the traffic cone. The base shall be square or rectangular to prevent rolling. Traffic cones shall be as manufactured by Services and Materials Company or approved substitute.

Portable delineators shall be fabricated of material of sufficient rigidity to remain upright when unattended and collapsible or flexible upon direct or glancing impact from a vehicle without damage to either the vehicle or the portable delineator. The base shall be square or rectangular to prevent rolling.

The vertical portion of the portable delineator shall be not less than 3-inches in width or diameter. The minimum height shall be 37-inches above the pavement surface. A minimum of two (2) reflective bands each not less than three (3) inches wide shall be mounted a minimum of 1 ½ inches apart at least one of the bands is between 30 and 36-inches above the road surface. Portable delineators shall be manufactured by Services and Specialties Company or approved substitute.

(b) Reflective Bands

Reflective bands shall be silver-white in color and fabricated from flexible sheeting having not less than the following dry reflectance values at a 0.2 and 0.5 degree divergence angle, expressed in units of candlepower per foot candle per square foot as determined by California Test 642. The wet reflectance values shall be not less than 90 percent of the dry values when tested in accordance with the Federal Highway Administration Specification FP-79, Section 718.01.

TABLE 2-01
Reflectance Values of Reflective Band Sheeting

Divergence Angle (degrees)	Incidence Angle (degrees)	Dry Reflectance Value
0.2	-4	250
0.2	30	95
0.5	-4	200
0.5	30	60

Only one type of portable delineator shall be used on the project.

(c) Barricades

Barricades fabricated in accordance with “Barricade Characteristics” and “Typical Barricades” of the CALTRANS Manual of Traffic Controls shall be placed adjacent to all open excavations, stockpiles material, or equipment left unattended with the permission of the Engineer. Barricades left in-place during periods of darkness shall be equipped with battery-operated flashing amber lights in accordance with [Section 3-A.05 “Traffic Control” \(d\) Portable Flashing Beacons](#) of these Standard Specifications. Each lit barricade shall be inspected and tested for flasher operation daily and repaired or maintained as necessary. Illuminated and/or reflectorized cones and delineators shall not be used in lieu of portable barricades for night traffic control.

(d) Portable Flashing Beacons

Portable flashing beacons shall consist of a lighting unit, a flasher unit, a standard, a battery power source, and a base. The units shall be assembled to form a complete, self-contained flashing unit which can be delivered to the job site and placed in immediate operation.

The lens shall have a visible diameter of 6-inches of plastic or glass conforming with ANSI Standard D-10.1 for yellow traffic signal lens.

The flasher shall be capable of a sustained 50 to 60 flashes per minute.

The battery power source shall be mounted in the base and the base shall be capable of attachment to a Type I, Type II, or Type III portable barricade.

The portable flashing beacons shall be Flex-O-Lite, as manufactured by Flex-O-Lite, Incorporated or approved substitute.

(E) Flaggers

The Contractor shall provide flaggers to direct traffic through the work area in addition to the construction area signs whenever necessitated by the field conditions, the Traffic Plan, or directed by the Engineer. Flaggers shall be equipped with all safety clothing and communication equipment required by the Industrial Safety Orders of the State of California and the current edition of the CALTRANS publication "Instructions to Flaggers". Flaggers shall be dedicated to traffic control and shall not be assigned any other duties while acting as flaggers.

Paddle signs used by flaggers shall be in accordance with [Section 3-A 05, "Traffic Control" \(2\) Stationary-Mounted Signs](#) of these Standard Specifications. The sign shall be handhold able for extended periods of time at a height of 5-LF above the pavement surface. A rod-mounted flagger sign may be used instead of the paddle-type at any time and shall always be used where prolonged queuing is anticipated. When flaggers are out of sight of each other, both shall be equipped with two-way radio equipment with channels dedicated solely to the flagging operation. Additionally, in areas where full road closure controlled by flaggers is necessary, an additional person shall be stationed at the actual site of work equipped with a radio on the same channel or frequency as the flaggers. This person shall act as the liaison between the flaggers and the construction operation and shall keep the flaggers informed of the status of the operation. This person shall also be dedicated to the flagging operation. As necessary, flaggers may direct the foreman or superintendent to temporarily suspend operations to permit passage of traffic.

Queue times shall be kept as short as possible and in no case longer than 15 minutes. Emergency vehicles, school buses, and other vehicles that demonstrate an emergency need shall be passed through immediately.

(F) One-Way Traffic, Lane Closures, and Detours

The Contractor shall maintain at least one lane open to traffic at all times while construction activities are in progress. The Contractor shall provide all flaggers necessary to control vehicles through the work area. Flaggers shall be located at each end of the work area and shall be able to maintain communications via visual signal or two-way radio communication at all times. The Superintendent or his appointee shall oversee the construction activities to ensure that the flaggers are fully informed of all traffic conditions at all times.

Except as provided for in the District Contract documents, no streets may be closed or detours made without the express written approval of the Engineer and the Agency of jurisdiction over the work areas. If the Contractor proposes to close lanes on multi-lane streets or detour public traffic around work areas, he shall submit a plan for such detour at least 4-working days or that period provided for in the Contract Documents prior to his proposed schedule to commence detours or lane closures. This plan shall include but not be limited to, the following information:

- Limits of detour or lane closures;
- Reason for detour or lane closure;
- Duration of detour or lane closure;
- Signing and controls for detour and lane closure;
- Additional information that will assist in the review of the plan.

No lane closure or detour shall be effectuated without the express written permission of the Engineer and the Agency of jurisdiction. When a Traffic Control Plan is provided for in the Contract Documents, the plan for detours and lane closures shall be included in such Traffic Control Plan.

(G) Pedestrian Access

The Contractor shall provide pedestrian access through the work areas at all times. This access may move from one side of the street to the other as construction activities require. The Contractor shall be responsible for the safety of all pedestrians transiting the work areas at all times.

(H) Access to Adjacent Properties

The Contractor shall maintain access to adjacent properties at all times during construction. When construction activities require that such access be interrupted, the Contractor shall first notify all property owners and/or tenants that their access will be interrupted, the commencement and duration of the interruption, and request that the property owners and/or tenants provide the Contractor with any special access requirements such as but not limited to, those of the elderly or the disabled. The access to all adjacent properties shall be restored whenever construction activities are not in progress, at the end of each work day, and over all weekends or holidays. The access shall be restored by the closure of the excavation, removal of materials and equipment, or installation of steel plates to transition over construction activities.

The Contractor shall notify the property owner and/or tenant at least 24-hours in advance of interrupting access by personally contacting the property owner and/or tenant. Door hangers may be used to provide this notification. The Contractor shall notify the Engineer of all instances where disruption of access will be required and of the notification of the property owners and/or tenants.

The requirement for notification 24-hours in advance may be waved when the following conditions are met:

The duration of interruption is less than 2-hours;

- The property owners have been notified immediately prior to commencing the interruption;
- The Contractor assists the property owner and/or tenant to leave the property prior to commencing the interruption;
- The Contractor accommodates any request for assistance by the property owner and/or tenant in accessing the property;
- The property owner and/or tenant is unavailable at the time of commencing the interruption and during the interruption.

(I) Open Trenches

No trenches shall be left open overnight or when construction activities are not in progress. Each trench shall be backfilled to the surface or covered with steel plates if backfilling is impracticable. The Contractor shall not open more trench than can be successfully completed and backfilled in one day. Where this requirement may be impracticable, the Contractor shall request permission from the Engineer to extend the trench to its practical limit and to cover it with steel plates.

Open trenches parallel to traveled lanes shall be marked with cones, delineators, or portable folding barricades during active construction operations. There shall be a sign at each end of the trench warning of an open trench. The Contractor shall be responsible for the safety of all persons having access to an open trench including but not limited to the general public, the Contractors personnel, and employees and agents of agencies having jurisdiction over the work areas.

(J) Measurement and Payment

(1) Lump Sum Basis - When traffic control is provided for in the Contract Documents to be paid for as a lump sum item, the contract lump sum price shall include full compensation for all labor, Agency fees, materials, equipment, and tools and for doing all work in establishing traffic control through and around the work areas. It shall include but not be limited to, the Traffic Control Plan, all construction area signs, cones, delineators, portable barricades, flashing lights, and flaggers and the notification, installation, maintenance, and equipage necessary for the control of traffic through and around the work site.

(2) Work under Time and Materials Basis - When traffic control is provided for in the Contract Documents to be paid on a time and materials basis, the Contractor shall maintain all records and receive all approvals from the Engineer for the establishment and maintenance of traffic control through and around the work areas. The Contractor shall submit records in accordance with 6-3 Measurement and Payment for all labor, materials, equipment, and tools and for doing all work in establishing and maintaining the traffic control system through and around the work areas. Such records shall include but not be limited to, the Traffic Control Plan, all construction area signs, cones, delineators, portable barricades, flashing lights, and flaggers and the notification, installation, maintenance, and equipage necessary for the control of traffic through and around the work site.

(3) Incidental Basis - When a pay item for traffic control is not included in the Contract Documents, all costs for such traffic control shall be considered as incidental to other items of work and all costs associated with traffic control shall be included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

3-A.06 Erosion Control

(A) General

At all times during the prosecution of the work on a project, the Contractor shall take all measures necessary to prevent damage to the work areas or adjacent properties due to the erosion of materials caused by the effects of weather. Such measures shall include but not be

limited to, channelization, berms, dikes, catchment structures, sedimentation basins, silt fences, and seeding in accordance with these Standard Specifications, the Contract Documents, and agencies having jurisdiction over the site of the work.

(B) Erosion Control Plan

The Contractor shall have an erosion control plan for the management of storm runoff within the work areas. Such plan for work involving the mass grading of soils shall include drawings that show the overall site of work, the routing and control of runoff through the work areas, sedimentation basins, and other pertinent details.

The Contractor shall have the erosion control plan for mass grading areas prepared by a Registered Civil Engineer and comply with the Regional Water Quality Control Board's Storm Water Pollution Prevention Plan Requirements (SWPPP).

An erosion control plan will not be required for the construction of pipelines; however, the Contractor shall take such measures as are necessary to prevent the erosion of the trench line or adjacent property. Such measures shall be approved by the Engineer prior to commencing construction.

(C) Maintenance

The Contractor shall be responsible for the inspection and maintenance of all erosion control facilities constructed as part of the project. In anticipation of any forecast storm, the Contractor shall inspect and, as appropriate, restore all erosion control facilities to ensure that optimum protection is provided. During any storm or storms that continue more than one day, the Contractor shall inspect and restore all erosion control measures on a daily basis, including weekends and holidays as necessary. The Contractor shall provide all materials, equipment, and personnel necessary to accomplish erosion control.

Upon completion of all work on the project and, as appropriate, successful germination of erosion control seeding, the Contractor shall remove all erosion control measures and structures and restore the site to its original condition, insofar as practicable.

If the Engineer determines that the implementation of erosion control measures constitutes an emergency, the Contractor shall have responsible personnel on the site within one hour of verbal notification by the Engineer and shall immediately commence work on such erosion control measures as are required by current conditions. If the Engineer determines that forces other than the Contractors must be mobilized due to a condition posing an imminent hazard to

life or property, he will authorize the mobilization of such forces as are necessary for the protection of life and property.

In determining unavoidable delays in accordance with Section 5-A General Conditions of these Contract documents, erosion control work will not be considered constructive work on the project in the calculation of the number of hours worked to make that determination.

(D) Seeding

Areas including but not limited to, cut slopes, fill slopes, building pads, and mass grading that are to be left in an exposed condition upon completion of all work shall be seeded by the hydro-mulch process with a mixture of grasses and seed conforming with the requirements of the Santa Cruz County Erosion Control Mix in the proportions listed in Table 2-02.

TABLE 2-02
Santa Cruz Erosion Control Mix

Seed	Percentage by Weight
Blando Brome Grass	42.50%
Hycon Rose Clover	34.18%
Zorro Fescue	8.21%
Creeping Red Fescue	14.01%
Various	1.10%

If the Contractor wishes to use an alternative mixture, he shall submit the mixture to the Engineer for approval prior to proceeding with the seeding operation.

The seed shall be thoroughly mixed with inert fiber material, fertilizer (16-20-0) and water and applied under pressure with a nozzle. The selection of agitator, air pressure, and nozzle size shall be the responsibility of the Contractor. The total application rate for erosion control seeding shall not be less than 35 pounds per acre. Inert fiber shall be applied with the seeding at a rate of at least 2,000 pounds per acre. Fertilizer shall be applied at the rate of 350 pounds per acre.

Except as provided for in the Contract Documents, the Contractor shall be responsible for providing adequate watering of the seed mix until such time as the site evidences adequate germination. Such evidence shall be the presence of healthy, vigorous plants over the entire

site. Areas in excess of 100 square-feet evidencing poor or non-existent germination shall be reseeded where directed by the Engineer.

(E) Measurement

Except where provided in the Contract Documents to be paid on a unit price or lump sum price basis, erosion control measures shall be considered as incidental to other items of work and no measurement will be made thereof.

Where provided in the Contract Documents to be paid for on a unit price basis by area, the quantities of erosion control will be determined by measurement of the area to be treated for erosion control to the nearest 10 square-feet or 1 square-yard.

(F) Payment

Where provided for in the Contract Documents to be paid for as a unit price or lump sum price item, the contract unit or lump sum price for Erosion Control shall include full compensation for providing all materials and equipment and for performing all work involved in Erosion Control including but not limited to, erosion control plans, grading, channelization, sedimentation basins, seeding, maintenance and inspection, and emergency response as provided for in these Standard Specification, the Contract Documents, and as directed by the Engineer.

3-A.07 Utility Marking Systems

(A) General

Wherever provided for in the Contract Documents, the Contractor shall mark the improvements in accordance with the colors shown in Table 2-03. Buried pipelines and facilities may be marked by the use of pigmented pipe materials, epoxy coated pipe and fittings, detectable locator tape, above grade flexible marking post, painted covers or such other marking system as may be provided for in the Contract Documents.

The Contractor shall submit color chips for approval in accordance with Section 6-D Submittals of the District Construction Documents prior to applying or installing any markings. All paint and coating materials shall be applied in accordance with the Manufacturer's recommendations. The specific color cited herein shall be considered as the basis of comparison by which the submitted color will be evaluated.

TABLE 2-03
Colors for Utility Marking

Product	Color	Equivalent Color Standard		
		Ameron	Carboline	Rust-Oleum ²
Raw Water	Med. Grey	GR-2	2713	V2188
Potable Water	OSHA Safety Blue	BL-6	S150	V2124
Recycled Wastewater	OSHA Safety Purple	--	--	V2167
Backwash Water	Buff Brown	BR-3	G243	V2171
Chlorine (NaCl)	Haze Green	GN-5	2369	--
Caustic (NaOH)	Deep Yellow	YE-4	56071	V2147
Meta-Bisulfite (H ₂ SO ₂)	OSHA Safety Black	BK-2	C900	V2176
Poly Ortho Phosphate (PO)	OSHA Safety White	WH-2	S800	V2192
Gaseous Product (Gas, Oil, Diesel, Steam, Chemical)	OSHA Safety Yellow	YE-3	S625	V2143
Electric	OSHA Safety Red	RD-2	S525	V2163
Communications (Telephone, CATV, Fiber Optic)	OSHA Safety Orange	OR-2	S401	V2155
Wastewater, Storm Drain	OSHA Safety Green	GR-6	S375	V2133
Compressed Air	Ivory	YE-2	0857 ¹	--

¹ Lead free

² Rust-Oleum Colors are for Labor Saver Hard Hat Industrial Coatings.

Underground utility installations shall be marked with a detectable underground utility marking tape in colors conforming with the American Public Works Association Uniform Color Code or that of the local One Call Locating Agency.

(B) Measurement and Payment

No separate measurement will be made for work relating to marking systems. Payment for installing and painting marking systems shall be considered as included in the contract unit or lump sum price for other items of work and no additional compensation will be allowed therefor.

END OF DOCUMENT

3-B POTABLE WATER SYSTEM**3-B.01 General Requirements****(A) Private Fire Services**

Private fire services shall be sized in accordance with the requirements of the Scotts Valley Fire Protection District and these Standard Specifications. No taps or services of any kind will be allowed on the District maintained side of such private fire services.

Fire service connections shall be in conformance with District Standard Plan 10.

(B) Combination Fire and Domestic Services

Where directed by the Scotts Valley Fire Protection District, combination services shall be installed in accordance with Standard Plan No.1, No. 2 & No. 4. With the exception of the domestic service tap shown thereon, no taps of any kind will be permitted on the District maintained side of such combination fire and domestic services. The property owner of record shall be responsible for the installation and maintenance of all piping and appurtenances on the property side of the meter assemblies as provided for in said standard plan.

(C) Non-Domestic Services

All services supplying water for irrigation, commercial, and industrial uses, and those connecting to private systems simultaneously served in whole or in part by sources other than the District shall be installed in accordance with the provisions shown on the Standard Plans and Project Plans and shall be in accordance with [Section 3-B.01, "General Requirements" \(K\) Cross-Connection Control](#), of these Standard Specifications. If irrigation is supplied by Scotts Valley Water District's recycled water system, shall be installed in accordance with the District's Recycled Water System Standards and Specifications.

(D) Distribution System Layout

All pipe lines within the distribution system shall be constructed at the locations provided for on the approved Project Plans. Except as expressly permitted by the Engineer, all new pipelines shall be installed in the public right-of-way. In the absence of public right-of-way within the project limits, pipelines shall be installed in private rights-of-way. Where it is impractical to install pipelines within rights-of-way as provided for herein, every effort shall be made to install pipelines in areas providing the greatest potential for access for future system operations. The actual location of the pipelines shall be approved by the Engineer prior to issuing the plans for construction.

All pipelines shall extend to the property boundaries of the project or the projections thereof and completely across the frontage of all single parcels within the project.

(E) Minimum Pipe Size

The minimum pipe size within the distribution system shall be 6-inches inside diameter. Pipelines of less than 6-inch diameter may be used only if approved by the District Representatives prior.

(F) Valve Type and Spacing

All valves smaller than 10-inch diameter shall be resilient wedge type gate valves. All valves 12-inch and larger shall be butterfly type. Valves shall be spaced at intervals not exceeding 500-feet in all distribution systems. Where a continuous run of pipe does not exceed 600-feet, an intermediate valve may not be required. Valves on continuous runs of pipe shall be located at the projection of property lines and at intervals that divide the total length as evenly as possible.

Valves shall be located on each branch of a three-way and four-way intersection, at each fire hydrant, at each blow-off assembly, at each private fire service, and where directed by the Engineer. Valves shall be installed on the fitting at the main pipeline in each instance.

Valves shall also be located at each end of pipelines crossing private property through easements, casings, major stream or channel crossings, at the projected property lines of hospitals, schools, and major industrial users.

(G) Air and Vacuum Valves

Combination air and vacuum release valves shall be installed at each high point in the pipeline where air can be trapped during filling of the pipelines. All combination air and vacuum release valves shall be installed in accordance with Standard Plan No. 24, "Air Valve Installation" or Standard Plan No. 25, "Below Grade Air Valve Installation".

(H) Blow-Off Valves

Blow-off valves shall be installed at each low point in the pipeline to facilitate flushing of the pipeline. Blow-off valves shall also be installed at the terminus of all temporary and permanent dead ends not provided with a fire hydrant. All blow-off valves shall be installed in accordance with Standard Plan No. 23 "Blow-Off Installation".

(I) Minimum Trench Dimensions

All pipelines shall be designed for a minimum pipe coverage based on the values found in Table 3-05, "Minimum Trench Dimensions" of these Standard Specifications and with Standard Plan No. 14, No. 15 and No. 16.

All pipelines shall be designed to be constructed at the minimum depth whenever possible. Any deviation from the minimum depth shall be done as gradually as possible with the minimum of fittings and approved by the Engineer in advance.

TABLE 3-05
Minimum Trench Dimensions

Pipe Diameter	Trench Width	Main Depth of Cover	Service Depth of Cover
6-inch	18-inches	36-inches	24-inches – 36-inches
8-inch	20-inches	36-inches	24-inches – 36-inches
14-inch and larger	Diameter + 12-inches	36-inches or as Directed	24-inches 36-inches

(J) Service Connections

All service connections shall be made in accordance with these Standard Specifications and Standard Plans and the direction of the Engineer. Multiple services from one connection to the pipeline must be approved by the Engineer during design review. The District will furnish and install the meter. All customer side plumbing shall be the responsibility of the property owner. All piping and appurtenances from the pipeline to the meter shall be installed by the pipeline contractor unless otherwise approved. All parcels fronting the improvements shall have a service installed to the meter and sized for the anticipated use of the parcel. The size of the service shall be approved by the Engineer prior to soliciting proposals for construction.

(K) Cross-Connection Control

(1) General - Each service connecting to the District distribution system shall be subject to a review of that service's potential for cross-connection of non-potable water in accordance with the requirements of Title 17 of the State of California Administrative Code. All services for the purpose of supplying water for uses other than domestic potable supply including but not

limited to, fire protection, irrigation, recycled water, industrial processes, and those having an alternative source of water on-site shall be subject to this review.

(2) Cross-Connection Control Materials - All materials for use in backflow prevention assemblies shall be in accordance with these Standard Specifications and the current requirements of the District Cross-Connection Control Policy and Procedures.

Reduced pressure principle backflow prevention assemblies shall be on the current list of approved devices published by the University of Southern California Foundation for Cross-Connection and Hydraulic Research and shall be testable and serviceable in-situ. Each assembly shall be equipped with 2 shut-off valves tapped for testing and a means of locking the valves to prevent tampering. Isolation valves and unions shall be so located that the entire assembly can be removed and replaced without excavation or interference with surface obstructions. Test cocks shall be so located as to permit testing and sampling on the supply and service sides of the assembly and each element thereof.

(3) Cross-Connection Control Construction - Each reduced pressure principle backflow prevention assembly shall be located as close as practicable to the meter serving it or at the point of connection during flushing and disinfection operations. All construction shall be in accordance with the following District Water System Standard Specifications:

1. Service Connection
2. Meter Box Detail
3. 1-inch and Smaller Multiple Branched Service Installation
4. 2-inch Combination Service
Combination $\frac{3}{4}$ inch Fire and Domestic Service Installation
5. 2-inch and Smaller Service Installation
6. 3-inch or 4-inch Service installation
7. 6-inch and Larger Fire Service Installation
8. 2-inch and Smaller Backflow Prevention Assembly Installation
9. Standard 4-inch and Larger Fire Service Installation

(L) Testing, Inspection, and Maintenance

Upon completion of construction and prior to activating the service, all reduced pressure assemblies shall be tested and inspected by the District's Cross-Connection Control Program Specialist.

The owner of the assembly shall have the assembly inspected and tested by a qualified technician approved by the District. Such inspection and testing shall be conducted at the

frequency required by the District and in no case less than once annually. A report of each such test and inspection and a record of all maintenance work shall be submitted to the District's Cross-Connection Control Program Specialist within 10 working days of completion of the inspection or maintenance.

The owner of the assembly shall be responsible for all costs associated with such inspection and any required maintenance determined by such inspection and testing.

Failure on the part of the owner to submit the required testing reports and to perform all maintenance required to maintain the assembly in the proper working order shall be cause for discontinuation of service and the assignment of all penalties under the law.

3-B.02 Transmission and Distribution Pipelines

(A) Description

All pipelines constructed for the purpose of conveying potable water from a source, storage facility, pumping facility, or treatment facility to the point of use shall be defined as transmission and distribution pipelines. This definition shall also include but not be limited to, piping assemblies at such facilities, fire hydrant laterals, and services 3-inch and larger to the meter. Unless specifically indicated otherwise on the Project Drawings or allowed by prior written permission of the District, all transmission and distribution pipelines shall be constructed using ductile iron pipe or PVC C900.

Services smaller than 3-inch, fittings, valves, and appurtenances shall be installed and constructed in accordance with other sections of these Standard Specifications and the Contract Documents.

(B) Ductile Iron Pipe

Where called for in the Contract Documents or at the Contractor's discretion and subject to the Engineer's prior approval, transmission, and distribution water mains may be constructed of cement-lined, centrifugally cast ductile iron pipe conforming with the requirements of AWWA C151, Class 50. Joints shall be of the push-on bell type with restraining gaskets. Each full length of pipe (18-LF) shall be provided with one bell type joint. Cement-mortar lining shall conform with the requirements of AWWA C104. (U.S. Pipe TYTON⁷ with FIELD-LOK⁷, TRFLEX⁷, or approved substitute.)

(C) Ductile Iron Pipe (Above Ground)

All above ground piping shall only be ductile iron piping. Ductile Iron Pipe assemblies including but not limited to, storage tank piping, pump stations, treatment plants, and wells. Except as provided for on the Project Plans.

(D) Poly Vinyl Chloride (PVC) Pipe

(1) General - All polyvinyl chloride (PVC) pipe shall be cast-iron equivalent outside diameter with push-on bell type joints. Each joint shall be equipped with one elastomeric gasket. Each full length of pipe (20-feet) shall be provided with one bell type joint. Where provided for in the Contract Documents, PVC pipe shall be equipped Certa-Lok restrained joints as manufactured by CertainTeed Corporation. Each joint shall be equipped with one elastomeric gasket and the grooved restraint system of the C900/RJ Restrained Joint PVC System as manufactured by CertainTeed Corporation.

Pipe wall thickness by pressure class and dimension ratio shall be as found in Table 3-02 PVC Pipe Pressure Class of these Standard Specifications.

TABLE 3-02
PVC Pipe Pressure Class

Pressure Class	Dimension Ratio (DR)
100	Not Permitted
150	18
200	14

(2) Pipelines 12-inch Diameter and Smaller - Except as provided for in the Contract Documents, all transmission and distribution water mains 12-inches in diameter and smaller shall be constructed of polyvinyl chloride (PVC) pipe in accordance with the requirements of AWWA C900.

(3) Pipelines 14-inch Diameter and Larger - Except as provided for in the Contract Documents, all transmission, and distribution water mains 14-inches in diameter and larger shall be constructed of polyvinyl chloride (PVC) pipe in accordance with the requirements of AWWA C905.

(4) Pipe Color - All pipe materials shall be manufactured with an ultraviolet protecting pigment. Pipe materials for potable water systems shall be pigmented in white including bell couplings.

(E) Pipeline Construction, Fabrication, and Installation

(1) Trenching - The Contractor shall bear full responsibility for safety related to his trenching operations and comply with all federal, state and local statutory requirements including the State of California Division of Industrial Safety and Federal Office of Safety and Health Administration.

Trenching, bedding, and backfill operations including but not limited to, pavement cutting and restoration, excavation, shoring, and steel plates shall be in accordance with [3-D.01 "Bedding, Backfill, and Aggregate Base"](#) of these Standard Specifications. Insofar as practicable and at all times on grades in excess of 1-foot horizontal to 10-feet vertical (10 percent), trenching and pipe laying operations shall proceed uphill from the lowest point with the bell end leading.

(2) Daily Limits - The Contractor shall excavate only that length of trench in which he can safely and properly install pipe and backfill daily. No trenches may be left open when the Contractor is not actively prosecuting work related to that trench. To facilitate the prosecution of the work, the Contractor may request to use plates to cover open trenches. The use of steel plates shall be dependent upon the prior approval of the Engineer.

(3) Handling and Placing - The Contractor shall employ such devices and equipment as will enable the pipe to be transported, stored, and installed in its final location or configuration, as provided for in the Contract Documents.

Pipe to be installed in trenches shall be lowered into the trench using lowering slings and other devices that will prevent an uncontrolled drop into the trench. Compacted bedding material conforming with [3-D.01 "Bedding, Backfill, and Aggregate Base"](#) of these Standard Specifications shall be installed in the bottom of the trench and compacted prior to placing pipe in the trench. Bell holes shall be excavated such that the pipe is fully supported by the pipe barrel. Pipe shall not be permitted to be supported solely by the bells. Where the Contract Documents call for or the Contractor elects to use sand/cement slurry backfill material, the pipe shall be supported on wooden blocks or other supports on each side of every joint. Such blocks shall be of such dimension as to raise the pipe high enough to clear the bells and long enough to span at least 2/3 of the trench width. Wooden blocks shall be redwood or pressure treated timber.

(4) Separation from Non-Potable Lines and Hazardous Facilities - New Treated drinking water mains shall be constructed in compliance with the California Code of Regulation (CCR) Title 22, Division 4, Chapter 16, Article 4, Section 64572.

If conditions requires construction at clearances less than those prescribed by the above-mentioned code, approval from the California Department of Public Health shall be obtained prior to construction.

Four feet clear horizontal distance shall be maintained between water service laterals and sanitary sewer laterals. Three feet clear distance shall be maintained between water service laterals and other utility lines.

Joint Trench with water lines and other utilities are prohibited.

If separation requirements cannot be met, encasing the potable water main may be an approved solution by the Districts Representatives. Encasement pipe must be PVC C900 and length of encasement must be approved by District Representatives prior to installation.

(5) Locator Wire - A wire to be used for future subsurface location shall be installed concurrent with pipe laying operations. The wire shall be a minimum of No. 10 AWG stranded and coated. The wire shall be continuous for the entire length of pipe laid. The wire shall be secured to the pipe by either tape, mastic, or looping at a maximum interval of 10-LF. Connections between lengths of wire shall be made either by soldering, or wire nut connectors. Each connection shall be at least double-wrapped with PVC electrical tape with each turn lapping the previous turn by at least 50-percent. The wire shall be brought to the surface at each valve box with at least 2-feet of wire more than that required to reach the surface. In bringing the wire to the surface, the wire shall be routed outside the barrel of the valve box then led into the barrel at the top of the barrel and below the surface structure. The wire shall be protected during backfilling operations to prevent displacement or continuity breaks. Any damage to the locator wire shall be immediately repaired.

(6) Hydrostatic Testing - Upon completion of pipeline construction, the Contractor shall fill the pipeline with water from an approved source, normally the existing pipeline to which the new pipeline will be connected. The District will provide the water for hydrostatic testing up to and including one retest of the pipeline. Water necessary for all additional hydrostatic testing may be charged to the Contractor in accordance with these Standard Specifications. All work in hydrostatic testing of pipelines shall conform to the requirements of AWWA C600, these Standard Specifications, and the Contract Documents.

The Contractor shall provide all pumps, fittings, labor, equipment, and materials and all assistance necessary, including but not limited to, temporary thrust restraint and connection to the supplying water source for the hydrostatic testing of all pipelines. Hydrostatic testing shall be performed in the presence of the District's Inspector. Test pressures shall be a minimum of 155-psi or 150-percent of the service pressure for the pipeline, whichever is the greater, at the highest point in the distribution system to be tested. At no time shall the test pressure be allowed to exceed the working pressure rating of the weakest pipe, valve, fitting, or service on the line to be hydrostatically tested.

Test pressures shall be held for a minimum of 2 hours or that period of time provided for in the Contract Documents. During the hydrostatic test, the pressure shall not be allowed to vary more than 5-psi above or below the required test pressure. Tests shall not be held against closed line valves without the prior written approval of the Engineer and all hydrant valves shall be open. Where service lines have been installed prior to conducting the hydrostatic test, the service line to the meter stop shall be included in the test. An additional allowance of 0.0078-gph/inch of service line diameter may be included for each service line included in the hydrostatic test in the calculation of allowable leakage in such cases.

Upon completion of pipeline construction all pipelines and pump suction barrels shall be hydrostatically tested and observed for leaks. The Contractor shall schedule the hydrostatic test with the Engineer at least one working day in advance of the test. The pipelines or pump suction barrels shall be filled and carefully brought to the test pressure. Failure of any portion of the system shall be cause for rejection and the Contractor shall promptly identify and correct deficiencies causing the failure. The hydrostatic test shall be repeated until a satisfactory test is achieved. All visible leaks shall be promptly repaired regardless of the actual leakage measured.

This procedure shall be followed until an acceptable test is achieved. The Contractor may be charged for the Engineer's time for re-inspection for all tests past the first retest in accordance with these Standard Specifications.

Cross-Connection Control shall be implemented per [Section 3-B.01, "General Requirements" \(K\) Cross-Connection Control](#) of these Standard Specifications during hydrostatic testing.

(a) Allowable Leakage - The allowable leakage will be calculated by the following formula:

$$\text{PVC } La = (ND \sqrt{VP})/7,400 \quad \text{DIP } La = (ND \sqrt{VP})/3,700$$

Where: La = Allowable leakage in gallons per hour

D = Nominal diameter of the pipe in inches

P = Test pressure in psi

N = The number of joints in the length of pipe tested

Leakage is typically measured by leaving the pump used to conduct the pressure test attached to the main. At the end of the required two-hour duration, the calculated acceptable leakage volume is placed in the feed bucket for the pump. The main is then pumped back up to the pressure at which the test began. If the water in the bucket runs out before the test pressure is reached, the main fails. The District may provide a meter when small leakage quantities must be measured accurately.

(b) Equipment - The Contractor shall provide a test pump capable of supplying 300-psi static pressure, a means of adding replacement water during the test, and gauges and meters to monitor the pressure and replacement water used.

(7) Flushing and Disinfection - All disinfection will be performed by the Contractor. The Contractor shall provide access to the pipe to be tested, including service taps for chlorination in accordance with these Standard Specifications. All disinfection shall be in accordance with AWWA C651, "Disinfecting Water Mains". Except as otherwise required by the District, chlorination shall be accomplished after preliminary flushing at a minimum velocity of 2.5-ft/s in accordance with the provisions of the Continuous Feed Method as found in AWWA C651. Chlorinated water shall be brought to a minimum concentration of 25-mg/l as determined by testing a sample of the water immediately.

The Contractor shall assist District forces in this flushing operation including but not limited to, providing water trucks, hoses, valves, neutralizing chemicals, and directing the discharge to a safe disposal point.

The Contractor shall allow a period of 2 working days from the time the sample is taken until the results are available. Bacteriological samples will be taken for analysis only during normal working hours Monday through Thursday noon (holidays excluded) of any week.

Upon completion of a satisfactory test for chlorine residual, the main shall be flushed at a velocity of not less than 2.5-ft/s for a minimum period of 15-minutes until the chlorine residual drops to 0.5-mg/l or less. The District may require that the chlorine residual be reduced to some lower concentration. At this time, a bacteriological test shall be taken in accordance with AWWA C651, "Bacteriological Tests". Should this test fail to produce results satisfactory to the

local Department of Environmental Health, the flushing and disinfection shall be repeated until such time as a satisfactory test is made.

The Contractor may be charged for re-inspection and re-testing in accordance with these Standard Specifications.

Upon completion of chlorination and a satisfactory test, the Contractor shall remove the service pipe, cross connection control, meter stop, and the meter box and restore the surface to its final condition as described elsewhere herein. The Contractor shall neutralize the chlorine laden water with a solution of sodium thiosulphate in accordance with AWWA C651 prior to disposing of disinfection water.

Insofar as practicable, locations of chlorine taps and blow-offs for flushing will be shown on the project plans. The Contractor shall provide an allowance in his proposal for the cost of all chlorine taps shown plus at least 2 additional taps that may be required by field conditions.

Upon completion of disinfection, the line will be flushed by District forces using the blow-off points indicated on the plans.

Super-chlorinated water shall be dechlorinated before being discharged to a sanitary sewer. Flushing into the Sanitary sewer shall be coordinated with the City of Scotts Valley sanitation department 48-hours prior to flushing.

Laboratory testing Monday through Friday can be done by Scotts Valley Water District staff. The Contractor shall hire his own laboratory to perform the analysis if occurring during the weekend. Such laboratory shall have the prior approval of the local Department of Environmental Health and District representatives. The District's Inspector shall take the sample and deliver the sample to the Contractor in a sealed bottle with a District transmittal form. The Contractor shall then deliver the sample to the laboratory and return the transmittal form and a minimum of 3 copies of the test results to the Engineer. The sample shall not be considered acceptable until written approval of the Engineer is received by the Contractor.

SVWD will notify Contractor of the results of the test. Should either of the initial Bacti-Test samples indicate the presence of coliform bacteria or should any of the General Physical test fail, flushing and sampling (both bacteriological and GP) shall be repeated once. If isolated sample points indicate coliform bacteria, flushing and re-sampling of those points may be approved by the District. If satisfactory results are unachievable, the main must be re-chlorinated and re-sampled. After re-chlorination, if satisfactory results are still unachievable, the Contractor shall locate and remove the source of contamination.

(F) Measurement Quantities

Measurement quantities of transmission and distribution pipeline will be measured to the nearest 1 linear foot increment or portion thereof along the centerline of the pipeline as constructed. Except as provided for in the Contract Documents, all fittings and thrust restraint systems installed as part of such pipeline shall be considered as incidental to the construction of such pipelines and no additional compensation will be allowed therefor.

Except as provided for in the Contract Documents, quantities of pipeline constructed as part of pipeline assemblies including but not limited to, that piping for wells, booster stations, and tanks shall be considered as incidental to the construction of such piping assemblies and no additional compensation will be allowed therefor.

(G) Payment

The contract unit price paid per linear foot for Ductile Iron Pipe (DIP) or PVC C900 the contract lump sum price paid for piping assemblies shall include full compensation for furnishing all labor, tools, equipment, materials, and incidentals and for doing all work involved in construction of the pipeline complete in place, including but not limited to, excavation, bedding, backfill, pavement repair, handling and transportation, thrust restraint, fittings, corrosion protection, disinfection, flushing, and hydrostatic testing as specified in these Standard Specifications and as provided for in the Contract Documents and no additional compensation will be allowed therefor.

3-B.03 Service Pipe Materials**(A) Description**

Service pipe materials shall be defined as all pipe and tubing necessary to convey potable water from a transmission or distribution pipeline to the point of use. Service pipe materials shall also include all pipe and tubing included as a portion of or integral to appurtenances, pumps, and tanks and all fittings necessary for the construction or installation of service pipe materials.

Except as provided elsewhere herein or in the Contract Documents, all pipeline and services larger than 3-inch in diameter shall be provided, constructed or installed as provided for in [Section 3-C.02, "Recycled Transmission and Distribution Pipelines"](#) of these Standard Specifications.

(B) Copper Tubing

(1) Materials - Copper tubing shall be Type "K" soft seamless copper tubing conforming with the requirements of ASTM B88M, Type K, and AWWA C800. Copper tubing shall be used for all services in which the service pressure exceeds 200-psi. In all other installations, copper tubing shall only be used as incidental material in the installation of above grade piping assemblies and for residential water services.

Except as provided for in the Contract Documents, fittings for Type "K" copper tubing shall be of the Grip Tite, pack joint, or compression type conforming with the requirements of AWWA C800, Section 5.

(2) Construction - Threads of fittings shall receive a liberal coating of pipe thread compound immediately prior to assembly and the follower shall then be securely threaded onto the fitting without over tightening and damaging the threads.

In laying the copper tubing the Contractor shall ensure that the tubing is not subject to point loads due to any source, kinking or crimping, cuts, scratches, or abrasions in excess of 10-percent of the tubing wall thickness. All tubing shall be cut using a cutter designed for cutting copper tubing. Damaged tubing shall be removed and replaced in accordance with the provisions of these Standard Specifications.

In approaching and leaving fittings and meters, the tubing shall not be bent in a curve with a radius tighter than 30 times the nominal diameter of the tubing. A straight run of tubing at least 10 times the nominal diameter shall be provided on each side of each fitting. A tubing bender shall be used to prevent crimping of the copper tubing.

Any damage to the tubing or fitting including but not limited to evidence of over tightening, misaligned threads, burring or scarring of machined faces, or any evidence of leakage shall be cause for rejection. If a leak is found to be caused by debris, the debris shall be cleared and the tubing and fitting visually inspected for damage before being charged. If the leak recurs upon charging of the line, the tubing and fitting shall be removed and replaced whether or not the cause can be determined.

When the total continuous length of tubing is less than 3-feet, the entire length shall be removed and replaced. When the total length of copper tubing exceeds 3-feet, the damaged fitting shall be removed along with the preceding 6-inches (minimum) and replaced with a brass Grip Tite pack joint, or compression type coupling and replacement fitting and a length of Type "K" copper tubing.

Where copper tubing is to be connected to a dissimilar metal, a dielectric union shall be used to isolate the materials and prevent corrosion.

(C) Polyvinyl Chloride Service Piping (PVC)

(1) PVC service piping shall be Schedule 40 or Schedule 80 polyvinyl chloride (PVC) pipe conforming with the requirements of ASTM D1784 and D1785. Polyvinyl chloride service piping shall only be used as incidental material in the installation of above grade piping assemblies and the reconnection of customer plumbing to meters.

Fittings for PVC service piping shall conform to the following ASTM specifications:

Solvent Weld, Schedule 40 (Slip x Slip)	ASTM D2466
Solvent Weld, Schedule 80 (Slip x Slip)	ASTM D2467
Solvent Weld Iron Pipe thread (Slip x IPT)	ASTM F437
Iron Pipe Thread	ASTM D2464

Cement for solvent weld pipe and fittings shall be in accordance with ASTM D2564. Primers for solvent weld pipe and fittings shall be in accordance with ASTM F656. The method of installation and assembly for solvent weld fittings and pipe shall be in accordance with ASTM D2855. The specific method of assembly, class of pipe, and fittings shall be as provided for in the Contract Documents. If conditions in the field vary from or are not provided for in the Contract Documents, the Contractor shall request direction from the Engineer prior to proceeding with the installation and assembly of PVC service piping.

(2) Construction - The Contractor shall assemble solvent weld fittings and pipe in accordance with the provisions of ASTM D2855 and these Standard Specifications. Pipe ends and the interior of fittings shall be cleaned of all loose and deleterious material and primed with solvent primer in accordance with the manufacturer's recommendations. A liberal coating of cement shall then be applied to both surfaces to be mated. The pipe shall be immediately inserted into the fitting or socket and rotated approximately 180 degrees to ensure complete and even coverage of the cement and surfaces. The joint shall be held for at least 30 seconds until the cement has taken its initial set and no movement of the joint occurs. The pipe shall not be charged before the minimum time recommended by the manufacturer of the cement. Any leaks discovered upon charging the line shall be repaired by removing the joint or fitting in question and replacing the entire assembly.

Threaded PVC fittings and pipe nipples shall be Schedule 80. In assembling threaded PVC pipe and fittings, the Contractor shall take care that the pipe is not scored in excess of 1/10th of the wall thickness. Threads of fittings shall receive a liberal coating of pipe thread compound

compatible with PVC pipe immediately prior to assembly and the pipe shall then be securely threaded onto the fitting without over tightening and damaging the threads.

Any damage to the pipe or fitting including but not limited to, evidence of over tightening, misaligned threads, burring or excessive scarring of pipe and fitting surfaces, or any evidence of leakage shall be cause for rejection. If a leak is found to be caused by debris, the debris shall be cleared and the assembly visually inspected for damage before being charged. If the leak recurs upon charging of the line, the fitting shall be removed and replaced whether or not the cause can be determined.

When the total continuous length of PVC service piping is less than 3-feet, the entire length shall be removed and replaced. When the total length of PVC service piping exceeds 3-feet, the damaged fitting shall be removed along with the preceding 6-inches (minimum) and replaced with the appropriate type of coupling, PVC service piping, and a replacement fitting.

(D) Iron Service Piping

(1) Material - Iron service piping shall be galvanized or black welded/seamless steel pipe conforming with the requirements of ASTM A53. All subsurface installations shall be galvanized pipe. Iron service piping shall only be used for appurtenances including but not limited to, blow-offs, backflow prevention assemblies, and in piping assemblies for facilities including but not limited to, pump stations, storage tanks, and treatment plants.

Fittings for iron service piping shall be threaded malleable iron welded/seamless type conforming with the requirements of ASTM A865. Fittings shall be either galvanized or black iron matching the pipe of the assembly.

(2) Construction - Pipe ends and the interior of fittings shall be cleaned of all loose and deleterious material. Pipe ends shall be mechanically threaded to match the threaded fittings in accordance with ASTM A865 and cleaned of all scale, shavings, cutting oil, and other deleterious material.

In assembling threaded iron pipe and fittings, the Contractor shall take care that the pipe is not scored in excess of 1/10th of the wall thickness by any means including but not limited to, spinning the pipe within tool jaws. Threads of fittings shall receive a liberal coating of pipe thread compound compatible with steel pipe immediately prior to assembly and the pipe shall then be securely threaded onto the fitting without over tightening and damaging the threads.

Galvanized iron pipe used as part of subsurface appurtenances shall be wrapped and coated with double lapped Protecto Tape or approved substitute. Iron pipe connected to dissimilar metals shall be insulated against corrosion by the use of a dielectric union.

Any damage to the pipe or fitting including but not limited to evidence of over tightening, misaligned threads, burring or excessive scarring of pipe and fitting surfaces, or any evidence of leakage shall be cause for rejection. If a leak is found to be caused by debris, the debris shall be cleared and the assembly visually inspected for damage before being charged. If the leak recurs upon charging of the line, the fitting shall be removed and replaced whether or not the cause can be determined.

When the total continuous length of iron service piping is less than 3-feet, the entire length shall be removed and replaced. When the total length of iron service piping exceeds 3-feet, the damaged fitting shall be removed along with the preceding 6-inches (minimum) and replaced with the appropriate type of coupling, iron pipe service piping, and a replacement fitting.

(E) Measurement and Payment

Service line piping incidental to appurtenances, pumping facilities, and tanks shall be considered as incidental to and included in the contract unit or lump sum price paid for other items of work and no additional compensation will be allowed therefor.

3-B.04 Fittings

(A) Description

All fittings for transmission and distribution pipelines and piping assemblies shall be in accordance with this [Section C-04, "Fittings"](#) of these Standard Specifications. For the purpose of this [Section C-04, "Fittings"](#), shall include but not be limited to, all tees, crosses, bends, reducers, flanges, make-up spools, repair couplings, sleeve-type couplings, transition couplings, tapping tees, flange coupling adapters, thrust restraining follower glands and harnesses, and flexible expansion joints. All fittings shall be rated for a minimum working pressure of 250-psi or that working pressure provided for in the Contract Documents.

(B) Ductile Iron Fittings

(1) Description - Except as provided for in the Contract Documents, all fittings on transmission and distribution pipelines and piping assemblies shall be manufactured of ductile iron in accordance with the provisions of AWWA C110 and/or C153. The interior of the fitting shall be cement-mortar lined in accordance with the provisions of AWWA C104. Mortar thickness shall be 1/16-inch for fittings up to 12-inches in diameter and 3/32-inch for fittings larger than 12-

inches in diameter. The exterior shall be coated with an asphaltic coating approximately 0.001 inches thick. The asphaltic material shall be continuous and smooth, free of holes, blisters, or thick areas. The material shall remain pliable at temperatures below freezing and not sticky to the touch if stored in direct sunlight for any length of time.

The body of the fitting shall be free of blows, sand pits, and abrasions deeper than 10-percent of the material thickness, cracks, and other defects that adversely affect the performance of the fitting under pressure in-situ or the corrosion potential of that fitting. Likewise, the coatings shall be free of chips, holes, abrasions, and scratches that reduce the thickness of the coating below the tolerances specified herein.

Longitudinal contraction cracks in the cement-mortar lining less than the pipe diameter in length may be accepted if the Contractor can demonstrate that the crack will self-heal upon immersion in water. Minor abrasions and scratches in the asphaltic coating may be repaired by the use of a bitumastic coating, subject to the prior approval of the Engineer.

Evidence of such defects or damage shall be cause for rejection of the fitting and the Contractor shall replace such defective or damaged fittings at no cost to the Owner.

(C) Joints

(1) General - Joints on fittings used in subsurface installations of transmission and distribution pipelines shall be mechanical joint, restrained joint (Tyton® with Field-Lok®) or flanged type, as provided for in the Contract Documents, conforming to the requirements of AWWA C111 and these Standard Specifications. In piping assemblies, both subsurface and above grade, the joints shall be either mechanical joint or flange type conforming with the requirements of AWWA C110, C111, and C153 as provided for in the Contract Documents.

(2) Mechanical Joints - Each mechanical joint shall be supplied with a vulcanized butadiene rubber (SBR) gasket in accordance with the provisions of AWWA C111. The retainer or follower gland shall be replaced with a thrust restraining follower gland in accordance with the provisions of Section 3-05, "Thrust Restraint" of these Special Provisions. Mechanical joint bolts (tee bolts) shall be 3/4 inches in diameter and be furnished for each joint in accordance with AWWA C110, AWWA C111, and AWWA C153. Bolt material shall be high-strength, low-alloy steel.

(3) Flanged Joints - Each flanged joint shall be supplied with a ring type, 1/8-inch thick composite or neoprene rubber gasket conforming with the provisions of AWWA C110. Bolts and nuts shall be hex head in conformance with ASTM A307 and A563 in accordance with the provisions of AWWA C110. Bolts and nuts shall be fabricated of low carbon steel conforming

with ASTM A307 galvanized after fabrication or stainless steel conforming with ASTM F593 and F594.

(4) Push-On (Tyton7) Joints - Push-On (Tyton®) joints shall only be used between straight lengths of ductile iron pipe. The joint shall be integrally cast into the bell of the pipe in accordance with the provisions of AWWA C151 and C111. The Tyton® gasket shall be replaced with a Field-Lok® gasket where provided for in [Section 3-B.05, "Thrust Restraint"](#) of these Standard Specifications and the Contract Documents.

(D) Construction

(1) Mechanical Joints - Mechanical joints shall be installed in accordance with the manufacturer's recommendations and these Standard Specifications. The fitting shall be thoroughly cleaned of all dirt, debris, or other deleterious material and inspected prior to incorporation into the work.

The pipe end shall be beveled with a grinding tool or rasp file to facilitate the assembly of the joint. The restraining follower gland shall be slipped over the end of the pipe followed by the gasket. The Contractor shall take care that the restraining follower gland and gasket are installed in the correct alignment and the gasket is not forced onto the pipe or otherwise damaged.

The pipe end shall then be inserted into the joint to the tolerance required by AWWA C110, C111, and C153. The pipe shall be aligned as straight as field conditions permit but in no case shall the pipe be deflected in excess of 3 degrees (5/8-inch per foot) or that maximum deflection recommended by the manufacturer, whichever is the lesser. The gasket shall then be inserted into the gasket seat taking care not to force or otherwise damage the gasket.

Tightening of the follower gland to drive the gasket into the seat will not be permitted. Once the gasket is fully and evenly seated in the gasket space, the follower gland shall be aligned with the mating face of the fitting and the bolts inserted and the nuts threaded onto the bolts.

All bolting shall be performed in accordance with the provisions of [Section 3-B.06 "Bolting Procedures"](#) of these Standard Specifications.

(2) Flanged Joints - Flanged joints shall be installed in accordance with the manufacturer's recommendation and these Special Provisions. The fitting shall be thoroughly cleaned of all dirt, debris, or other deleterious material and inspected prior to incorporation into the work.

The pipe and fitting shall be carefully aligned using slings, blocks, jacks, or other means necessary to establish and maintain the correct alignment. Under no circumstances shall the bolts be used to achieve the correct alignment. As the bolts are inserted through the flange the gasket shall be inserted between the mating faces of the fitting and pipe.

All bolting shall be performed in accordance with the provisions of [Section 3-B.06 "Bolting Procedures"](#) of these Standard Specifications.

(3) Push-On (Tyton®) Joints - Push-on (Tyton®) joints shall be installed in accordance with the manufacturer's recommendation and these Special Provisions. The bell end of the receiving pipe shall be thoroughly cleaned of all dirt, debris, or other deleterious material and inspected prior to incorporation into the work.

The pipe end shall be beveled with a grinding tool or rasp file to facilitate the assembly of the joint. The end of the pipe and the bell of the receiving pipe shall be lubricated with a joint lubricant in accordance with the provisions of AWWA C111. The pipe end shall then be inserted into the joint to the tolerance required by AWWA C110, C111, and C153. The pipe shall be aligned as straight as field conditions permit but in no case shall the pipe be deflected in excess of 3 degrees (5/8-inch per foot) or that maximum deflection recommended by the manufacturer, whichever is the lesser.

(E) Bolted Couplings

(1) Description - For the purposes of this [Section 3-B.06 "Bolting Procedures"](#) of these Standard Specifications bolted couplings shall be limited to flange coupling adapters and make-up spools.

(F) Flange-Coupling Adapters and Make-Up Spools

Flange-Coupling Adapters shall have a thrust restraining capability when used with ductile iron or welded steel pipe. The restraint mechanism shall consist of multiple, individually activated gripping surfaces. The follower gland shall be manufactured of ductile iron conforming with ASTM A536. The follower gland shall be sized in accordance with AWWA C110 and C111 to be compatible with standard flanged joint fittings. Tee bolts shall be in accordance with said AWWA specifications.

The gripping surfaces shall activate by a wedging action. Each restraining device shall be equipped with a twist-off nut of the same size as the tee bolts. The head of the nut shall be capable of shearing when the applied torque exceeds the specified torque for the particular size fitting. The flange-coupling adapter shall be Megalug® Series 2100 Megaflange-Flange Adapter manufactured by EBAA IRON SALES, INC. or an approved substitute.

Make-Up Spools for transmission and distribution pipelines shall be short body ductile iron sleeves otherwise conforming with the requirements of Section 3-04.02, "Ductile Iron Fittings" of these Special Provisions. The mechanical joint follower gland shall be replaced with a ductile iron restraining follower gland in accordance with [Section 3-B.05, "Thrust Restraint"](#) of these Standard Specifications

3-B.05 Thrust Restraint

(A) Description

All pipelines and piping assemblies shall be restrained against the hydrostatic and hydrodynamic forces inherent within public potable water supply and distribution systems. Thrust restraint shall be accomplished by the use of mechanically restrained joints, restraint harness, or cast-in-place Portland cement concrete thrust blocks. Grooved, welded, and flanged fittings shall be considered as thrust restrained fittings.

(B) Mechanically Restrained Joints

All mechanical joint fittings and pipe shall have the follower gland replaced with a thrust restraining follower gland assembly. The restraint mechanism shall consist of multiple, individually activated gripping surfaces or a continuous, split-ring type of gripping surface. The restraining follower gland shall be manufactured of ductile iron conforming with ASTM A536. The follower gland shall be sized in accordance with AWWA C110, C111, and C153 to be compatible with standard mechanical joint fittings. Tee bolts shall be in accordance with said AWWA specifications. Only one type of restraining assembly will be permitted on the project.

Restraint mechanisms consisting of multiple gripping surfaces shall activate by a wedging action of the individual gripping surfaces. Each restraining device shall be equipped with a twist-off nut of the same size as the tee bolts. The head of the nut shall be capable of shearing when the applied torque exceeds the specified torque for the particular size fitting. The mechanical restraining follower gland shall be Megalug® Series 1100, Series 1100SD, Series 1100PV, or Series 2000PV as manufactured by EBAA IRON SALES, INC. or approved substitute.

Restraint mechanisms consisting of a single, split-ring type restrainer shall activate by a wedging action of the grip ring as a unit. This wedging action shall be initiated by the installation of a mechanical joint follower gland specifically designed for the split-ring restrainer and shall apply a uniform force throughout the length of the split-ring. The split-ring shall be manufactured of ductile iron conforming with ASTM A536. Split-ring type restrainers shall be GripRingJ as manufactured by Romac Industries, Inc. or approved substitute.

Each fitting shall be restrained in accordance with the recommendations of the publication "Thrust Restraint Design for Ductile Iron Pipe" as published by the Ductile Iron Pipe Association., AWWA Manual M23, and ASTM F1674, "PVC Pipe Restraint".

As a minimum, the Contractor shall install 40-lf of restrained pipe on each side of a restrained fitting or joint. At the Contractor's option and subject to the approval of the Engineer, thrust restraint at tie-ins to existing pipelines may be restrained by the use of Portland cement concrete thrust blocks in accordance with [Section 3-B.05, "Thrust Restraint" \(C\) Portland Cement Concrete Thrust Blocks](#) of these Standard Specifications. This option shall only be in lieu of removing and replacing 40-LF of asbestos cement pipe with restrained pipe on each side of the tie-in.

This restraint for ductile iron pipe shall be accomplished by replacing the standard push-on gasket with a restraining type gasket (FIELD LOK®) in accordance with [Section 3-B.02, "Transmission and Distribution Pipelines"](#) of these Standard Specifications.

(C) Portland Cement Concrete Thrust Blocks

Where provided for in the Contract Documents, the Contractor shall construct Portland cement concrete thrust blocks to restrain hydraulic forces. Thrust blocks shall be in accordance with Standard Plan 13A, "Std. Anchorage for Horizontal Elbows in Water Mains" and this [Section 3-B.05, "Thrust Restraint" \(C\) Portland Cement Concrete Thrust Blocks](#) of these Standard Specifications.

Normally, Portland cement concrete thrust blocks shall only be permitted to restrain fittings on existing pipelines. The Contractor shall not pressurize the main unit until the thrust block has achieved a minimum of 2/3 of the 28-day compressive strength or 7-days, whichever is the earliest. Where the main must be pressurized prior to that time, the Contractor shall provide temporary thrust restraint using timbers in a manner approved by the Engineer. Such temporary restraint shall not be removed from the excavation nor shall the temporary restraint interfere in any way with the permanent thrust block.

All concrete for thrust blocks shall be Class "B" concrete in accordance with [Section 3-B.05, "Thrust Restraint" \(C\) Portland Cement Concrete Thrust Blocks](#) of these Standard Specifications. The Contractor shall excavate the soil surrounding the thrust block with a minimum of unnecessary disturbance to the soil left in-place. If deemed necessary by the Engineer, the Contractor shall hand excavate the bearing surfaces to ensure full contact with undisturbed material.

Restraining rods and tie-rods shall be coated with a bitumastic type coating (Protecto Wrap 160/160H, Tapecoat Brush-Applied Coating, or approved substitute) prior to placement in the excavation. Such wrapping shall extend a minimum of 2-inches and a maximum of 4-inches into the concrete. The tie-rod diameter shall match the diameter of the bolts on the fitting restrained. Total embedment shall be a minimum of 18-inches. All bends shall have a minimum radius of 20 diameters. Heating shall not be used in bending bars and tie-rods. The radius shall be such that a minimum of 8-inches of straight stock is embedded in the concrete prior to commencing the bend. Evidence of heating, embrittlement, cracking, deformation, or other damage detrimental to the strength of the material shall be cause for rejection by the Engineer and the Contractor shall remove and replace such deficient material prior to pouring the thrust block at his expense.

All surfaces of fittings and pipe and all bolts and threaded rods shall be thoroughly coated with a bitumastic type sealant in accordance with [Section 3-B.06, "Bolting Procedures"](#) of these Standard Specifications.

The flanges, bells, follower glands, and bolts of all fittings shall be protected from contact with concrete during pouring. As required by field conditions, the Contractor shall wrap the joint portion of fittings with a stiff material such as roofing felt or install forms to confine the concrete to the plane of the proposed thrust block. The goal of this requirement is to enable the readjustment or removal of all bolts and plugs and the removal of the fitting itself at a later date without necessitating the removal of the thrust block first.

(D) Measurement and Payment

Except as provided for in the Contract Documents, thrust restraint shall be considered as incidental to other items of work and all costs shall be included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

3-B.06 Bolting Procedures

(A) Description

All fittings, joints, assemblies, valves, and miscellaneous special fittings shall be installed in accordance with this [Section 3-B.06, "Bolting Procedures"](#) of these Standard Specifications. The required torque shall be that specified in these Special Provisions, the Contract Documents, the referenced specifications, and the manufacturer's recommendations.

(B) Procedure

The pipe and fitting (or fittings) shall be carefully aligned using slings, blocks, jacks, or other means necessary to establish and maintain the correct alignment. Under no circumstances shall the bolts be used to achieve the correct alignment. As the bolts are inserted through the flange the gasket shall be inserted between the mating faces of the fitting and pipe.

After taking up the free slack in the nuts, the Contractor shall tighten each bolt in opposing succession taking multiple passes to achieve the proper tension. Opposing succession is hereby defined as tightening the first nut then the nut diametrically opposed to the first and proceeding either clockwise or counterclockwise in this manner around the circumference of the joint until the required torque is achieved. In no case shall the Contractor tighten the nuts in direct sequence or over tighten any nut with respect to its opposing mate.

During the tightening operation and again upon completion of the tightening operation, the space between the mating faces of the fitting and pipe shall be inspected for evidence of non-parallel assembly. The tolerance for parallel assembly shall be 1/16-inches for mechanical joint faces and 1/32-inches for flanged faces. Other fittings and faces shall be within the tolerance recommended by the manufacturer. If the space is non-parallel in excess of such tolerance, the joint shall be completely disassembled and the installation repeated. The gasket shall be inspected for damage prior to retightening the bolts. If the mating faces of the fitting and pipe cannot be brought into parallel alignment the joint shall be disassembled, the pipe removed, the gasket replaced, and the assembly repeated.

Upon completion of the bolting operation between elements of the fittings and joints, the Contractor shall tighten all thrust restraint gripping surfaces in the same manner of opposing succession. The thrust restraining follower gland shall be tightened to the recommended torque as recommended by the manufacturer. The twist-off nut shall be considered as a safety mechanism to prevent damage from excessive torsional forces. The shear capability shall not be used in lieu of proper tightening, including the use of limiting torque wrenches.

All bolts on the fittings or joint, including those of the thrust restraining devices, shall be subject to a torque test by the Engineer. If any bolts are found to be under- or over-torqued or in any way evidencing damage, the Engineer may direct their readjustment or replacement in accordance with the provisions of this [Section 3-B.06, "Bolting Procedures"](#) of these Standard Specifications.

Upon completion of the bolting operation, all buried fittings shall receive a liberal coating of bitumastic type material (Protecto Wrap 160/160H, Tapecoat Brush-Applied Coating, or approved substitute). This coating shall be thoroughly worked into the spaces between joint faces, under and around bolts and nuts, and on all surfaces that will be in soil contact. The

coating shall be allowed to attain an initial set prior to commencing any backfill operations and in no case shall backfill operations commence less than 1-hour after coating is completed.

3-B.07 Casing and Duct Installations

(A) Description

Where provided for in the Contract Documents, the Contractor shall install the water main or service piping within a steel casing or other ducting. Such installations shall include but not be limited to, freeway crossings, railway crossings, stream crossings, installations adjacent to structures, and service piping related to other facilities such as pumping and treatment plants. The water main or service piping shall be known as the carrier pipe for the purposes of this [Section 3-B.07 "Casing and Duct Installations"](#) of these Standard Specifications.

(B) Bore and Jack Installations

(1) General - Where provided for in the Contract Documents, the contractor shall install a casing by the boring and jacking method and insert the carrier pipe therein. The casing shall be welded steel pipe. Casing for jacking installation shall not be coated except as provided for in the Contract Documents.

(2) Pipe Thickness Design for Casings - The thickness of the pipe provided for in the Contract Documents shall be considered the minimum required thickness. The actual pipe wall thickness installed shall be that thickness necessary to withstand the jacking forces imposed by the jacking machine or that provided for in the Contract Documents, whichever is the greater. The Contractor shall bear full responsibility for the selection of the pipe wall thickness as provided for herein.

(3) Jacking Machines - The Contractor shall excavate jacking and receiving pits where shown in the Contract Documents. Such excavations shall be shored as necessary in accordance with the provisions of the State Industrial Safety Orders and the Safety Plan. The jacking pit shall be the minimum necessary to accommodate the jacking machinery. The jacking machine shall be of the hydraulically operated ram type with guide rails for the casing and boring tool. The jacking machine shall have a bearing plate of sufficient surface area to resist the forces applied, assuming a soil bearing pressure of 2,500 pounds per square foot or that value provided for in the Contract Documents. The receiving pit shall not be excavated any sooner than necessary to prevent delays in the jacking operation.

The Engineer will provide the first set of construction staking for the jacking and receiving pits and the alignment control of the boring operation. The Contractor shall provide the Engineer with all requirements for surveying unique to the machine and equipment used.

The jacking machine operator shall have the ability to monitor the jacking operation for displacements from the designed line and grade. The tolerance for alignment shall be one percent from the theoretical alignment. The Contractor may use welded wedges or deformed coupons along the length of the casing to guide the alignment.

(4) Survey Grid for Jacked Casings - Where provided for in the Contract Documents, the Contractor shall have a control grid of the surface over the centerline of the casing prepared by a surveyor or civil engineer registered in the State of California. The grid shall consist of points located on 5-foot centers along and 5-feet each side of the proposed alignment and a set of points 10-feet on center along and on each side of the 5-foot grid to a distance of 25-feet offset to the proposed centerline. These points shall be so marked as to be recoverable throughout the life of the project. The horizontal and vertical location of each of these points shall be determined no more than 5 working days prior to commencing boring and jacking operations. Upon completion of 2 working days following completion of boring operations, the grid will be resurveyed and the 2 sets of data compared.

(5) Tolerance for Jacked Casings - The actual bored diameter of the excavation shall be not more than 0.1-feet larger than the outside diameter of the casing. The Contractor may be required to demonstrate conformance with this requirement. If so required, the Contractor shall stockpile all spoils in a safe manner adjacent to the excavation for the Engineer to measure. Except as provided for in the Contract Documents, a bulking factor of 150 percent shall be applied to determine the actual volume excavated. This volume will be compared with that volume calculated from the outside diameter of the casing. If the difference in volume is excessive, as defined herein, the Contractor shall make provisions for and inject a cementitious grout throughout the length of the annular space outside the casing. The quantities of grout shall be carefully measured during the injection process. The Contractor shall immediately stop injection upon reaching the volume difference calculated herein or upon evidence of any displacement of the surrounding soil structure.

Each point of the survey grid provided for in [Section 3-D.07 "Casing and Duct Installation"](#) of these Standard Specifications shall be considered as undisturbed if the difference in elevation between the surveys is less than 0.02-feet.

If, in the opinion of the Engineer or the owner of the right-of-way crossed, the displacement of the surface so surveyed is deemed excessive, the Contractor shall determine the cause thereof

and provide remedial action to the satisfaction of such owner. Due to the nature of such work, the actual manner and extent of remediation can only be determined at the time of occurrence. Normally, this will include but not be limited to such work as injection grouting, pavement grinding, crack sealing, removal and replacement of damaged surface materials, and reconstruction of slopes adjacent to the roadway.

If the final alignment varies in excess of that tolerance provided for, the District may charge damages in the amounts provided for in the Contract Documents. In no case will the amount charged the Contractor be less than the actual costs incurred by the District including but not limited to, penalties, legal fees, engineering, inspection, right-of-way acquisition, and administration. If in the opinion of the Engineer, the installation is excessively out of tolerance and poses any hazard to the public safety or encroaches upon and encumbers property to which the District has no legal access, the Contractor may be required to reconstruct the installation where directed by the Engineer. The original installation shall be abandoned in place after filling with a sand slurry and capping the ends. If the original installation poses a hazard to public safety, the Contractor may be required to remove the casing and restore the site to a safe condition. All costs associated with such remedial work shall be borne by the Contractor.

(6) Carrier Pipe Installation - Upon completion of the casing installation the contractor shall install the carrier pipe in the casing or duct in accordance with [Section 3-D.07 "Casing and Duct Installation"](#) of these Standard Specifications.

The Contractor shall attach heavy-duty insulators to the barrel of transmission and distribution pipelines in advance of inserting the pipe into the casing. The insulators shall consist of a full-circumference steel band (minimum 14 ga.) With a rust resisting coating. Except as provided for in the Contract Documents, bearing skids may be eliminated from the top half of the insulator band. All bolts shall be 5/16-inch diameter cadmium plated hex head bolt and nut. The insulator shall be lined with a PVC insulating liner. The bearing skids shall be heavy duty PVC material chamfered on both ends to facilitate passage through the pipe.

Pipe skid insulators shall be Calpico Model M Series or approved substitute.

An insulator shall be attached to the barrel of each length of pipe within 1-foot of each joint to ensure that each length of pipe is fully supported by the insulators. An additional insulator shall be installed at mid-span on PVC pipe. After the insulators are in place the Contractor shall push or pull the pipe through the casing at a rate that will prevent the pipe from riding up on the wall of the casing and overturning. The Contractor shall use locks or bars across the surface of the

pipe end bearing the load of the installation. Insofar as practicable, the pipe shall extend past both ends of the casing at least 10-feet before the first exposed joint.

Where provided for in the Contract Documents the contractor shall seal the annular space between the casing and the carrier pipe with mechanical rubber seal to form a watertight seal capable of withstanding a 20-psi internal pressure. Such seals shall be Calpico Pipe Link®, Model CSL Linx or approved substitute. When an annular seal is provided for, the insulators shall be of the centering style.

After the carrier pipe is fully installed the Contractor shall install a pull-on end seal with a minimum of 2 stainless steel band clamps on each end of the casing. End seals shall be Calpico Model C or approved substitute.

The Contractor shall install carrier piping in non-metallic ducting by inserting the pipe through the duct. No insulators will be required unless provided for in the Contract Documents. The end of the duct, when fully buried shall be sealed with an end seal as provided for herein and all voids in the seal shall be sealed with a liberal injection of a silicone caulk.

(7) Measurement - Quantities of casing installation will be measured by the linear foot to the nearest 1-foot increment or portion thereof along the centerline of the pipeline as constructed. Except as provided for in the Contract Documents, all carrier pipelines, fittings, and thrust restraint systems installed within such casing installation will be paid for under the contract unit or lump sum price for pipelines or other items of work and no additional compensation will be allowed therefor.

(8) Payment - The contract unit price per linear foot for “Install Casing” or “Install Duct” shall include full compensation for furnishing all labor, tools, equipment, materials, and incidentals and for doing all work involved in installing casings and ducts including but not limited to excavation, boring, jacking, casing, welding, ducting, installing carrier pipe, insulators, seals, bedding, and backfill complete in place as shown in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

3-B.08 Valves

(A) Description

Valves shall be defined as all mechanisms used for controlling the flow of potable water or other fluid or gas from a transmission or distribution pipeline to the point of use as well as those mechanisms used to control the flow of water through piping assemblies associated with

pumping equipment, treatment works, and storage tanks. Valves shall include but not be limited to, gate valves, butterfly valves, ball valves, blow-off valves, air and air/vacuum release valves, check valves, pressure reducing or sustaining valves, pump control valves, surge control valves, solenoid activated valves, pneumatically activated valves, reduced pressure valves, rate of flow control valves, and altitude valves.

(B) Gate Valves

(1) Description - Gate valves shall be used for all pipeline and piping assemblies smaller than 10-inches in diameter. Such gate valves shall be iron body, bronze mounted resilient seat type with non-rising stem, conforming with AWWA C509 and these construction documents. Except as provided for in the Contract Documents, the Contractor shall only use the product of one manufacturer throughout the life of the project.

(2) Pressure Rating - Except as provided for in the Contract Documents, all gate valves shall be rated for zero-leakage (drip-tight) closure at 200 psi water working pressure or higher. Additionally, each valve shall be hydrostatically tested at 400 psi for structural soundness. Testing for conformance to these specifications shall be in accordance with AWWA C509.

(3) As called for in the Contract Documents, valve ends shall be mechanical joint, flange, or combination flange by mechanical joint. Such joints shall be in accordance with [Section 3-B.04, "Fittings"](#) of these Standard Specifications. Gate valves 2-inch and smaller shall be threaded.

(4) Materials - All materials used in the manufacture of gate valves shall be in accordance with the mechanical schedule shown in [Table 3-07 Mechanical Schedule](#) - Resilient Wedge Gate Valves of these Standard Specifications.

(5) Coatings - The interior of the valve body, bonnet, and seal shall be fusion-bonded epoxy coated to a minimum thickness of 0.005-inches in accordance with AWWA C550. The exterior shall be either epoxy coated in accordance with AWWA C550 or coated with an asphaltic varnish.

(6) Each valve body shall be marked during the casting process with the name of the manufacturer, year of manufacture, maximum working pressure, and valve size. The operating nut wing and the hand wheel shall be stamped with an arrow and the word OPEN to indicate the direction of opening.

(7) Design and Operation - All gate valves shall be non-rising stem, counter-clockwise opening. The valve shall be capable of operation in any position other than horizontal with full rated pressure in either direction.

TABLE 3-07

**Mechanical Schedule
Resilient Wedge Gate Valves**

Description	Material	Materials Standard
Bonnet bolts and nuts	Steel	ANSI B18.2(plated)
Test plug	Iron	
Retainer nut for wrench nut	Steel	ANSI B18.2 (plated)
Stuffing box gasket	Composition or Rubber	ASTM D1170 or D2000
Wrench nut	Cast Iron	ASTM A126, Class B
Stuffing box bolt and nut	Steel	ANSI B18.2 (plated)
Stem	Bronze	ASTM B138
Hand wheel	Cast Iron	ASTM A126, Class B
Stuffing box and stem O-ring	Rubber	ASTM D2000
Stuffing box	Cast Iron	ASTM A126, Class B
Disc	Cast Iron	ASTM A126, Class B
Seat Ring	Rubber	ASTM D2000
Retaining screw	Stainless Steel	Type 304
Bonnet	Cast Iron	ASTM A126, Class B
Bonnet gasket	Composition or Rubber	ASTM D1170 or D2000
Body	Cast Iron	ASTM A126, Class B

Thrust collars shall be a machined portion of the basic stock from which the stem is machined. A thrust bearing shall be incorporated into the stuffing box assembly. This thrust bearing shall be Type 304 stainless steel, Nylon 101 conforming with Federal Specification No. L-P-401A, or other low friction, non-corrosive material to optimize operating torques. The valves shall be furnished with 2 O-ring stem seals in the stuffing box above the thrust bearing and one below the thrust bearing. Each O-ring seal shall be set in a recessed groove machined into the stem shaft. The groove shall not be less than the root diameter of the stem threads.

The stuffing box and bonnet gaskets shall be either a full face flat composition type or an O-ring type set in a machined groove on both mating surfaces. The groove shall be so sized that the O-ring is compressed to fill the groove when the stuffing box and bonnet bolts and nuts are torqued to the manufacturer's recommendation. The disc shall be either fully encapsulated in Buna rubber conforming with ASTM D2000 or furnished with a field replaceable seat ring of

steel reinforced rubber secured by self-locking stainless steel screws. The disc shall be guided by integral lugs and guides in a tongue and groove manner throughout the range of travel.

The valve shall be so designed as to be serviceable without removal from the installation. The stuffing box shall be removable while the valve is under pressure in either the open or closed position. The bonnet and all internal components shall be removable with the valve in-situ.

(8) Warranty - Each gate valve shall be furnished with a manufacturer's 10-year limited warranty against defects in materials and workmanship. Such warranty shall transfer to the District upon final acceptance of the improvements.

(9) Representative Models - Gate valves shall be Mueller Super-Seal, Kennedy Ken-Seal TM II, M & H Style 3607 or Style 2500, Waterous "Series 500", or approved substitute.

(10) Construction and Installation - Each gate valve shall be installed in the locations and orientation provided for in the Contract Documents. Jointing to pipelines, fittings, and other valves shall be in accordance with the provisions of [Sections 3-B.04, "Fittings"](#) of these Standard Specifications.

Direct buried valves larger than 2-inch shall be supported by a block directly under the valve body. Such blocks shall be either redwood or pressure treated timber at least a nominal 4-inches in each dimension and 12-inches long. At the Contractor's option and subject to the Engineer's approval, other blocking materials, such as pier blocks, may be used. The valve shall be fully coated in accordance with [Section 3-B.06, "Bolting Procedures"](#) of these Standard Specifications. A valve box shall be installed over each valve in accordance with 5-05, "Concrete Structures" of these Standard Specifications.

Valves included in piping assemblies above grade or underground within vaults shall be supported by the use of pipe supports. Pipe supports shall be installed on a concrete pad of at least 4-inch thickness and 18-inches square. Pipe supports shall be Grinnell Figure 264, Standon Pipe Support Model S-89, or approved substitute.

(11) Testing and Acceptance - All gate valves shall be inspected by the Engineer prior to installation. Upon installation, each valve shall be operated under no pressure prior to charging the line to verify free travel without interference. Upon charging the pipeline, each valve shall be included in the hydrostatic test as provided for in [Section 3-B.02 "Transmission and Distribution Pipelines", \(E\) Hydrostatic Testing](#) of these Standard Specifications. Upon satisfactory completion of all work, each gate valve shall be operated under load to verify acceptable operation in accordance with the provisions of this [Section 3-B.02 "Transmission and Distribution Pipelines", \(E\) Hydrostatic Testing](#) of these Standard Specifications. The

Contractor shall bear full responsibility for the inspection, evaluation, removal, and replacement of defective gate valves as provided for in these Special Provisions.

(12) Measurement and Payment

Unit Basis - When gate valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing gate valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, backfill, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for gate valves is not included in the Contract Documents, all costs for such gate valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such gate valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

(C) Butterfly Valves

(1) Description - Butterfly valves shall be used for all pipeline and piping assemblies' 10-inches in diameter and larger. Such butterfly valves shall be iron body, rubber-seated geared type with traveling nut type stem, conforming with AWWA C504 and these Special Provisions. Except as provided for in the Contract Documents, the Contractor shall only use the product of one manufacturer throughout the life of the project.

(2) Pressure Rating - Except as provided for in the Contract Documents, all butterfly valves shall be rated for zero-leakage (drip-tight) closure at 150 psi steady-state working pressure, 150 psi differential pressure, and a maximum velocity of 16 fps. Testing for conformance to these specifications shall be in accordance with AWWA C504.

(3) Ends - As called for in the Contract Documents, valve ends shall be mechanical joint, flange, combination flange by mechanical joint, or wafer type. Such joints shall be in accordance with [Section 3-B.02, "Transmission and Distribution Pipelines" \(B\) Ductile Iron Pipe](#), of these Standard Specifications. The body may be either short body or long body style. The Contractor shall provide verification from the manufacturer that the length of the body is sufficient for the disc to rotate fully when used with the pipe provided for in the Contract Documents.

(4) Materials - All materials used in the manufacture of butterfly valves shall be in accordance with the mechanical schedule provided in [Table 3-08 Mechanical Schedule - Rubber-Seated Butterfly Valves](#) of these Standard Specifications.

TABLE 3-08
Mechanical Schedule
Rubber-seated Butterfly Valves

Description	Material	Material Standard
Operator cover bolts and nuts	Steel	ANSI B18.2 (plated)
Retainer nut for wrench nut	Steel	ANSI B18.2 (plated)
Operator cover gasket	Composition or rubber	ASTM D1170 or D2000
Wrench nut	Cast iron	ASTM A126, Class B
Operator to body bolts and nuts	Steel	ANSI B18.2 (plated)
Stem	Stainless steel	Type 304
Hand wheel	Cast iron	ASTM A126, Class B
Shaft seal	Rubber O-ring	ASTM D2000
Operator enclosure	Cast iron	ASTM A126, Class B
Disc	Cast iron	ASTM A126, Class B
Seat ring	Rubber	ASTM D2000
Retaining screw	Stainless steel	Type 304
Body	Cast iron	ASTM A126, Class B

(5) Coatings - The interior of the valve body, bonnet, and seal shall be fusion-bonded epoxy coated to a minimum thickness of 0.005-inches in accordance with AWWA C550. The exterior shall be either epoxy coated in accordance with AWWA C550 or coated with an asphaltic varnish in accordance with AWWA C110, Section 10-9.1, "Outside Coating".

(6) Markings - Each valve body shall be marked during the casting process with the name of the manufacturer, year of manufacture, maximum working pressure, and valve size. The operating nut wing and the hand wheel shall be stamped with an arrow and the word OPEN to indicate the direction of opening.

(7) Design and Operation - All butterfly valves shall be traveling nut type designed to withstand 300 foot-pounds of input torque at full open or full closed positions without damage to the valve or operator and counter-clockwise opening. The valve shall be capable of operation in any position other than horizontal with full rated pressure in either direction. The valve operator housing shall be fully gasketed, grease packed, designed for submersion in water to 10

psi (23.1-feet) and direct burial. The valve shall close with 20 to 40 turns, dependent upon size and manufacturer.

The operator body to valve body gaskets shall be either a full face flat composition type or an O-ring type set in a machined groove on both mating surfaces. The groove shall be so sized that the O-ring is compressed to fill the groove when the operator body bolts and nuts are torqued to the manufacturer's recommendation.

The disc may be furnished with a field replaceable seat ring of steel reinforced rubber secured by self-locking stainless steel screws. If so supplied, the disc shall seat against a machined seat within the valve body. If the disc of the valve furnished is not provided with a seat ring, a rubber body seat shall be set into a groove in the valve body. The rubber seat shall be so secured as to remain tight and drip free throughout the range of travel at full rated pressure.

The valve shall be so designed as to be serviceable without removal from the installation. The operator housing shall be removable while the valve is under pressure in either the open or closed position. The stem, disc, and all internal components shall be removable with the valve in-situ.

(8) Pneumatic Actuator - Where provided for in the Contract Documents, butterfly valves shall be equipped with pneumatic operators for automatic or combination manual/automatic control of valve operations. The actuator shall be capable of moving the valve from any position to fully open or fully closed upon application of air pressure. The actuator shall be speed controlled to match the minimum closing times required for the application to prevent excessive surge pressures.

(9) Warranty - Each butterfly valve shall be furnished with a manufacturer's 10-year limited warranty against defects in materials and workmanship. Such warranty shall transfer to the District upon final acceptance of the improvements.

(10) Representative Models - Butterfly valves shall be Mueller® or approved substitute.

(11) Construction and Installation - Each butterfly valve shall be installed in the locations and orientation provided for in the Contract documents. Jointing to pipelines, fittings, and other valves shall be in accordance with the provisions of [Section 3-B.04, "Fittings" \(C\) Joints](#) and [Section 3-B.04, "Fittings" \(F\) Flanged-Coupling Adapters and Make-Up Spools](#) of these Standard Specifications

Direct buried valves shall be supported by a block directly under the valve body. Such blocks shall be either redwood or pressure treated timber at least a nominal 4-inches in each

dimension and 12-inches long. At the Contractor's option and subject to the Engineer's approval, other blocking materials, such as pier blocks, may be used. The valve shall be fully coated in accordance with [Section 3-B.06, "Bolting Procedures"](#) of these Standard Specifications. A valve box shall be installed over each valve in accordance with 3.D.15, "Concrete Structures" of these Standard Specifications.

Valves included in piping assemblies above grade or underground within vaults shall be supported by the use of pipe supports. Pipe supports shall be installed on a concrete pad of at least 4-inch thickness and 18-inches square. Pipe supports shall be Grinnell Figure 264, Standon Pipe Support Model S-89, or approved substitute.

(12) Testing and Acceptance - All butterfly valves shall be inspected by the Engineer prior to installation. Upon installation, each valve shall be operated under no pressure prior to charging the line to verify free travel without interference. Upon charging the pipeline, each valve shall be included in the hydrostatic test as provided for in [Section 3-B.02, "Transmission and Distribution Pipelines"](#), [\(E\) Hydrostatic Testing](#) of these Standard Specifications. Upon satisfactory completion of all work, each butterfly valve shall be operated under load to verify acceptable operation in accordance with the provisions of this [Section 3-B.08, "Valves" \(C\) Butterfly Valves](#) of these Standard Specifications. The Contractor shall bear full responsibility for the inspection, evaluation, removal, and replacement of defective butterfly valves as provided for in these Standard Specifications.

(13) Measurement and Payment

Unit Basis - When butterfly valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work required in installing butterfly valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, backfill, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for butterfly valves is not included in the Contract Documents, all costs for such butterfly valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such butterfly valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

(D) Control Valves

(1) Description - Control valves shall be those valves called for in the Contract Documents whose purpose is to provide operational control and protection to piping systems, assemblies, storage and pumping facilities. Such control valves shall be as described herein. Operating pressure rating shall be Class 150 or as called for in the Contract Documents.

(2) Basic Valve

Description - The valve shall be hydraulically operated and diaphragm-actuated. The body and cover shall be fabricated of material in accordance with the mechanical schedule provided in [Table 3-09 Mechanical Schedule - Control Valves](#) of these Standard Specifications

Coatings - The interior of the valve body, bonnet, and seal shall be fusion-bonded epoxy coated to a minimum thickness of 0.005-inches in accordance with AWWA C550. The exterior shall be either epoxy coated in accordance with AWWA C550 or coated with an asphaltic varnish in accordance with AWWA C110, Section 10-9.1, "Outside Coating".

Markings - Each valve body shall have the manufacturer's name and the valve size cast on the exterior or the body. Additionally, each valve, pilot valve, and solenoid shall be provided with a plate that enumerates the manufacturer's name, date of manufacture, size, and type of valve, pressure rating, inlet and outlet, serial numbers, voltage ratings, and any additional information relevant to the particular valve. Alternatively, one plate may be used that provides this information on all valve components. This plate shall be permanently affixed to the valve with screws or rivets.

Design and Operation - The diaphragm assembly shall consist of a valve stem and a nylon fabric bonded with synthetic rubber. The valve stem shall be the only moving part in the assembly and the diaphragm shall not be used as a seating surface. The valve stem shall be guided by a bearing in the valve cover and an integral bearing in the valve seat.

TABLE 3-09
Mechanical Schedule
Control Valves

Description	Material	Material Standard
Body and cover	Ductile iron	ASTM A536
Cover gasket	Buna N rubber	ASTM D2000
Bolts	Steel	ANSI B18.2 (plated)

Diaphragm	Nylon bonded w/synthetic rubber	ASTM D2000
Seat ring	Rubber	ASTM D2000
Nozzle plugs	Malleable iron	ASTM A865
Retaining screw	Stainless steel	Type 304

It shall contain a resilient, synthetic rubber disc of a rectangular cross-section, contained on three and one-half sides by a disc retainer forming a tight seal against a single removable seat insert.

All external pipe and tubing required for pump operation shall be furnished with a polyurethane foam type pipe insulation to protect the valve components from freezing. Where called for in the Contract Documents, such pipe and tubing shall be equipped with in-line filters to remove particulate material from the control system.

All nozzles into the valve body shall be equipped with Flow Clean Strainers (Cla-Val Company Model X46 or approved substitute).

Packing glands or stuffing boxes will not be permitted. Except for solenoid actuated valves, no pistons, linkages, external pressure source, or other mechanical devices shall be used for pump operation or control.

All serviceable components of the valve shall be accessible with the valve in-situ. The valve body and cover shall be so designed as to permit conversion of the valve from one function to another without removing the valve from the line or requiring any modification to the valve body or cover, such as drilling and tapping.

Pressure Rating - Except as provided for in the Contract Documents, all control valves shall be rated for full operation at 150 psi steady-state working pressure and a maximum velocity of 20-fps.

Ends and Body Type - Valve ends shall be flange type in accordance with [Section 3-B.04, "Fittings" \(B\) Ductile Iron Fittings](#) of these Standard Specifications.

(3) Check Valves - All check valves shall be so designed as to open fully to permit flow when the inlet pressure is greater than the outlet pressure. When the outlet pressure is higher than the inlet pressure, the valve shall close drip-tight in response to the difference in pressure between the valve chamber and the diaphragm chamber. The valve shall be equipped with auxiliary

controls which will permit the adjustment of the opening and closing speeds. These speeds shall be set in accordance with the manufacturers' recommendations for the installation and operating conditions.

Check valves shall be Cla-Val Company Model 81-02 or 681-02, or approved substitute.

(4) Pressure Relief, Pressure Sustaining, and Back Pressure Valves - Pressure relief, pressure sustaining, and back pressure valves shall be pilot controlled valves that maintain the inlet pressure at a steady, preset pressure regardless of the outlet demand.

The pilot control system shall consist of a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve. This valve shall be designed to permit flow when controlled pressure exceeds the spring setting. The pilot control system shall operate such that as excess pressure in the pilot valve is dissipated the main valve shall close gradually to a drip-tight seating.

When used as a pressure relief valve, the valve shall be installed to protect piping systems from high surge pressures due to pump operations. The valve shall relieve such surges by shunting excess pressure surges to a zone of lower pressure. The routing of the relief valve will be shown in the Contract Documents.

When used as a pressure sustaining valve, the valve shall be installed in line with the piping between zones of higher and lower pressure to maintain the preset upstream pressure during periods of high demand in the lower zone. As the demand increases, the valve shall close gradually to prevent robbing from the upper zone.

When used as a back-pressure relief valve, the valve shall be installed off-line at the discharge of a pump to shunt pressure fluctuations to the suction side of the pump and maintain a constant discharge pressure. In all configurations, the valve shall operate automatically without additional field adjustment.

Pressure relief, pressure sustaining, and back pressure valves shall be Cla-Val Company Model 50-01 or 650-01, or approved substitute.

(5) Pressure Reducing/Pressure Sustaining Valves - Pressure reducing/pressure sustaining valves shall be pilot controlled valves that maintain the outlet pressure at a steady, preset pressure regardless of the inlet pressure or flow rate. The pressure sustaining function shall prevent "robbing" of the higher zone when the lower zone pressure falls below a certain pre-set point.

The pilot control system shall consist of a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve. This valve shall be designed to permit flow when controlled pressure is less than the spring setting and shall include a fixed orifice.

Pressure reducing valves shall be Cla-Val Company Model 92-01G or 692-01G, or approved substitute.

(6) Surge Anticipator Valve - A surge anticipator valve shall be installed to protect all pump stations where the calculated water hammer will increase the pressure in the system in excess of the design working pressure rating of that system or where called for in the Contract Documents. The time of closure to prevent the formation of such water hammer shall be as follows:

$$T_c = (0.027 \times L \times V) / \Delta p$$

Where:

T _c	= Time of closure (seconds)
L	= Length of pipeline (feet)
V	= Velocity of pipeline flow (fps)
Δp	= Change in pressure from full flow to no flow (psi)

The increase in pressure due to this surge shall be assumed to equal a value in psi of 60 times the pipeline velocity at normal flow.

Such surge anticipator valves shall be equipped with multiple pilot valves that will open the valve rapidly in response to high pressure or low pressure wave in the pipeline system. On a low pressure wave, the main valve shall open to a preset limit as controlled by a hydraulic limiter. Upon dissipation of the high pressure wave, the valve shall close slowly to drip-tight.

The surge anticipator valve shall be installed in such a manner as to shunt the high pressure wave out of the system to an area of lower pressure, preferably atmospheric. The routing of this discharge shall be called for in the Contract Documents.

Surge anticipator valves shall be Cla-Val Company Model 52-03 or 652-03, or approved substitute.

(7) Pump Control Valves - Pump control valves shall be installed on the discharge head of all pumps to regulate the rate of energy transfer from the pump to the receiving system. The valve shall also include an integral check capability to prevent a flow reversal. The valve shall be controlled by means of an externally mounted, four-way, solenoid pilot valve. The valve shall utilize line pressure for operation without external sources. A limit switch shall be

installed that is adjustable throughout the entire range of valve travel. The control system shall be protected by self-cleaning strainers.

The pump control valve shall open slowly upon receiving a signal from the Motor Control Center that pump startup has been initiated. Upon receiving a signal terminating pump operation, the valve shall slowly close drip-tight sealing the valve against flow reversal by the use of the check feature. This rate of opening and closing shall be field adjustable. The rate of both opening and closing shall be determined from the operating conditions and shall permit sufficient time for the dissipation of surge pressures and water hammer.

Pump control valves shall be Cla-Val Company Model 60-11 or 660-11, or approved substitute.

(8) Deep Well Pump Control Valves - Deep well pump control valves shall be installed on the discharge head of all well pumps to regulate the rate of energy transfer from the pump to the receiving system. The valve shall also include a flushing capability to prevent the introduction of sand and standing water in the well to the receiving system.

The valve shall be controlled by means of an externally mounted, four-way, solenoid pilot valve. The valve shall utilize line pressure for operation without external sources. A micro switch shall be installed to control the valve. The control system shall be protected by self-cleaning strainers.

The deep well pump control valve shall close slowly upon receiving a signal from the Motor Control Center that pump startup has been initiated. Upon receiving a signal terminating pump operation, the valve shall slowly open. This rate of opening and closing shall be field adjustable. The rate of both opening and closing shall be determined from the operating conditions and shall permit sufficient time for the dissipation of surge pressures and the flushing of the pump column.

The deep well pump control valve shall be installed in such a manner as to shunt the initial water column out of the system to an area of lower pressure, preferably atmospheric. The amount of time for the valve to close shall be determined such that the volume of the pump column is completely flushed. Additional time may be required to flush sand drawn into the well casing during pump startup. This additional time will be determined in the field at the time of installation. The routing of this discharge shall be as called for in the Contract Documents.

Pump control valves shall be Cla-Val Company Model 61-02 or 661-02, or approved substitute.

(9) Combination Valves - Multiple functions may be included in one valve, subject to the Engineer's approval. When permitted, multi-purpose valves shall be assembled in strict

accordance with the manufacturer's recommendations. No field modifications to create multiple functions will be permitted without direct supervision by the manufacturer's representative.

(10) Warranty - Each control valve shall be furnished with a manufacturer's 3-year limited warranty against defects in materials and workmanship. Such warranty shall transfer to the District upon final acceptance of the improvements.

(11) Construction and Installation - Each control valve shall be installed in the locations and orientation provided for in the Contract Documents. Jointing to pipelines, fittings and other valves shall be in accordance with the provisions of [Section 3-B.04 "Fittings" \(F\) Flange-Coupling Adapters and Make-Up Spools](#) of these Standard Specifications.

Control valves located in unheated structures or exposed to the weather shall have the chamber tubing wrapped in foam insulation a minimum of 1/2-inches thick and securely taped to the tubing.

Control valves shall be supported by the use of pipe supports. Pipe supports shall be Grinnell Figure 264, Standon Pipe Support Model S-89, or approved substitute. Pipe supports shall be installed on a concrete pad of at least 4-inch thickness and 18-inches square.

(12) Testing and Acceptance - All control valves shall be inspected by the Engineer prior to installation. Upon installation, each valve shall be set to the operating settings recommended for the particular application. Following setting, each control valve shall be operated under load to verify acceptable operation in accordance with the provisions of this [Section 3-B.08, "Valves"](#) of these Standard Specifications. The Contractor shall bear full responsibility for the inspection, evaluation, removal, and replacement of defective control valves as provided for in these Standard Specifications.

(13) Measurement and Payment

Unit Basis - When control valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing gate valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, backfill, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for gate valves is not included in the Contract Documents, all costs for such gate valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such gate valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

(E) Air Release Valves

(1) Description - Air release valves shall be installed on the surface plate of each pump suction barrel. The valve shall be capable of venting air trapped in the barrel to the atmosphere as the barrel is filled with water. The inlet of the valve shall be 2-inch in diameter. The orifice shall be 1/16-inch in diameter. The outlet of the valve shall be assembled using galvanized iron service piping to create a downward oriented return. The outlet of the piping shall be screened with stainless steel mesh secured with a stainless steel band clamp.

Air release valves shall be Cla-Val Model 34AR-116.3 or approved substitute.

(2) Measurement and Payment

Unit Basis - When air release valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing air release valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, venting, backfill, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for air release valves is not included in the Contract Documents, all costs for such air release valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such air release valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

(F) Air/Vacuum Release Valves

(1) Description - Air/Vacuum release valves shall be installed at high points within the distribution system. The valve shall be capable of venting air trapped in the pipeline to the atmosphere as the pipeline is filled with water. It shall also be capable of introducing air into the pipeline as the pipeline drains preventing the creation of a vacuum within the pipeline. The inlet of the valve shall be 2-inch in diameter. The orifice shall be sized for the specific

installation. The outlet of the valve shall be assembled using galvanized iron service piping to create a downward oriented return. The outlet of the piping shall be screened with stainless steel mesh secured with a stainless steel band clamp.

Air release valves shall be Cla-Val Model 36-CAV or approved substitute.

(2) Measurement and Payment

Unit Basis - When air/vacuum release valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing air/vacuum release valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, venting, backfill, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for air/vacuum release valves is not included in the Contract Documents, all costs for such air/vacuum release valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such air/vacuum release valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

(G) Duckbill Check Valve

(1) General - Where provided for in the Contract Documents, the Contractor shall install a duckbill style check valve to control a reversal of flow in situations that would otherwise be problematic. Such situations include but are not limited to, corrosive environments, tank internal valves, diffuser systems and storm outfall lines.

(2) Materials - The duckbill check valve shall consist of a flexible check sleeve with or without a valve body. The check sleeve shall be fabricated of pure gum rubber, Neoprene, Hypalon, Chlorobutyl, Polyurethane, Buna-N, Viton, or EPDM as provided for in the Contract Documents.

Where provided for in the Contract Documents, the valve body shall be cast iron conforming with the provisions of ASTM A126. The valve body shall be provided with a minimum of one clean out plug.

(3) Construction - Duckbill check valves shall be specifically designed for the application called for. The manufacturer shall review the project specific parameters to ensure that the

performance characteristics of the duckbill sleeve are compatible with the system pressures of the project.

Where a valve body is provided for in the Contract Documents, the clean-out plug shall be removed and replaced with a short nipple and ball valve for draining the valve.

(4) Measurement and Payment

Unit Basis - When duckbill check valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing duckbill check valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, backfill, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for duckbill check valves is not included in the Contract Documents, all costs for such duckbill check valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such gate valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

(H) Ball Valves

(1) Description - Ball valves shall be used as isolation valves only for small diameter service piping incidental to such items as but not limited to, cross-connection control assemblies, pressure monitoring systems, and air/vacuum release valves. Such ball valves shall be stainless steel two-or three-piece body conforming with these Standard Specifications. Except as provided for in the Contract Documents, the Contractor shall only use the product of one manufacturer throughout the life of the project.

(2) Pressure Rating - Except as provided for in the Contract Documents, all ball valves shall be rated for zero-leakage (drip-tight) closure at 150-psi steady-state working pressure, 150-psi differential pressure, and a maximum velocity of 16 fps.

(3) Ends - Valve ends shall be threaded.

(4) Markings - Each valve body shall be marked during the casting process with the name of the manufacturer, year of manufacture, maximum working pressure, and valve size. The operating

handle shall be stamped or marked with an arrow and the word OPEN to indicate the direction of opening.

(5) Design and Operation - All ball valves shall be full port type. The valve shall be capable of operation in any position other than horizontal with full rated pressure in either direction. The valve itself shall be a machined stainless steel ball seated against a machined seat with seal. The seal shall be NSF approved for use with potable water at the pressure-rating of the valve.

(6) Representative Models - Ball valves shall be Worcester Series 44, Milwaukee Valve 20SSOR, BA-360, 22SSOR or approved substitute.

(7) Construction and Installation - Each ball valve shall be installed in the locations and orientation provided for in the Contract documents.

(8) Testing and Acceptance - All ball valves shall be inspected by the Engineer prior to installation. Upon installation, each valve shall be operated under no pressure prior to charging the line to verify free travel without interference. Upon satisfactory completion of all work, each ball valve shall be operated under load to verify acceptable operation in accordance with the provisions of [Section 3-B.08, "Valves"](#) of these Standard Specifications. The Contractor shall bear full responsibility for the inspection, evaluation, removal, and replacement of defective ball valves as provided for in these Special Provisions.

(9) Measurement and Payment

Unit Basis - When duckbill check valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing duckbill check valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, backfill, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for duckbill check valves is not included in the Contract Documents, all costs for such duckbill check valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such gate valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

3-B.09 Fire Hydrants**(A) Description**

Fire hydrants shall be installed where called for in the Contract Documents. All such fire hydrants shall be of the wet barrel design and shall be manufactured in accordance with the provisions of AWWA C503. Each hydrant shall be equipped with one steamer and either one or two 2-1/2 inch hose ports. The number of 2-1/2 inch ports shall be as called for in the Contract Documents. The size of the steamer port shall be 4-1/2 inch or as provided for in the Contract Documents. Each port shall be threaded to National Standard Hose thread. The cap shall be equipped with a pentagonal nut of the same size as the operating nut and shall be chained to the hydrant barrel. The chain shall be so attached to the cap as to prevent its removal while permitting free rotation of the cap. Operating pressure rating for fire hydrants shall be 150 psi or as called for in the Contract Documents.

Each hydrant shall be equipped with a cast or ductile iron base shoe as manufactured by Clow.

Where provided for in the Contract Documents, the hydrant shall be equipped with a riser check valve assembly to prevent excessive discharge in the event of a break off of the hydrant. Such check valve assembly shall be capable of providing uninterrupted flow under normal operation and a slow closing capability following hydrant break off. The hydrant check valve shall be as manufactured by Little Squirt manufacturing or approved substitute.

(B) Coatings

All hydrants shall be painted with a minimum of one coat of OSHA yellow paint. Paint shall be Rust-Oleum 2143, DuPont 23663D, Aervoe 3-02, or Krylon 1813 or that color required by the Scotts Valley Fire Protection District.

(C) Markings

Each hydrant body shall have the manufacturer's name and the valve size cast on the exterior of the body. Additionally, the size of the steamer port shall be cast on the body of the hydrant and/or the steamer port cap.

(D) Design and Operation

All serviceable components of the hydrant shall be accessible with the hydrant in-situ. The hydrant shall open counterclockwise with a 1-1/4 inch pentagonal operating nut. The riser shall be equipped with a traffic breakaway spool and shear bolts. Each port shall operate independently. The discharge nozzles shall be in accordance with NFPA 1963, AStandard for

Screw Threads and Gaskets for Fire Hose Connections@. Nozzles shall be threaded to such a length as to provide a minimum of 4 to 5 threads. The hydrant shoe shall be of the mechanical joint type with the retaining or follower gland replaced with a thrust restraining follower gland in accordance with [Section 3-B.05, "Thrust Restraint"](#) of these Standard Specifications. The hydrant shoe shall permit full flow with a minimum of losses.

Shear or breakaway bolts shall be fabricated of full thread bolts with a machined hole bored in the center of the shaft. The bolt shall be capable of withstanding a torque of 70 ft-lbs and shear between 90 and 105 ft-lbs torque. Breakaway spools shall be a standard riser with a machined groove in the barrel that will shear under vehicle impact. The groove shall be a machined 45° V-groove of sufficient depth to reduce the barrel wall thickness to one-half the nominal thickness when measured from the interior wall.

Fire hydrant isolation valves shall be standard flange by mechanical joint resilient seat gate valves in accordance with [Section 3-B.08, "Valves" \(B\) Gate Valves](#) of these Standard Specifications. The retaining follower gland shall be replaced with a thrust restraining follower gland in accordance with [Section 3-B.05, "Thrust Restraint"](#) of these Standard Specifications. Such valves shall be installed at the main line fitting and supplied with a standard valve box in accordance with 5-05," Concrete Structures" of these Standard Specifications.

The top flange of the base shoe or riser shall be of the 6-hole pattern using 3/4-inch diameter shear bolts. Gaskets shall be of the ring type in accordance with [Section 3-B.04, "Fittings" Flange-Coupling Adapters and Make-Up Spools](#) of these Standard Specifications. The lower joint shall be mechanical joint in accordance with [Section 3-B.04, "Fittings"](#) of these Standard Specifications.

(E) Representative Models

Fire hydrants shall conform with the District Standard Detail No. 10 – "Fire Hydrant Installation".

(F) Construction and Installation

Each fire hydrant shall be installed in such a manner as to permit a minimum clear distance from any obstruction to the center of the hydrant of 3-feet. The hydrant shall be set a minimum of 18-inches from the back of curb or edge of traveled way to the nearest point on a port cap. The horizontal location shall be as called for in the Contract Documents except that the Engineer reserves the right to adjust the location up to 20-feet in any direction in response to conditions found in the field. Such conditions shall include but not be limited to, the location of other utilities, driveways, private improvements such as landscaping and earth retaining

structures, and the location of pipe joints. Such adjustment if required will be made in full cooperation with the Contractor during the layout of the pipeline and shall be considered as included in the contract unit or lump sum price for the fire hydrant and no additional compensation will be allowed therefor.

Insofar as practicable, fire hydrants shall be located at the projection of property lines within the public Right-of-Way and on the uphill side of the roadway. Where the proper location of the fire hydrant requires excavating into the adjacent slope and it is impracticable to maintain a slope of two horizontal to one (2:1) vertical or flatter, the Contractor shall construct a low retaining wall around the hydrant at the clearances provided for herein. Such retaining walls shall be constructed of precast modular concrete units with geotechnical fabric (Keystone with Tensor, or approved substitute). Unless otherwise provided for in the Contract Documents, the cost of such retaining structures shall be considered as included in the contract unit price for other items of work and no additional compensation will be allowed therefor.

Where called for in the Contract Documents, fire hydrants shall be protected by the installation of traffic barriers. Such barriers shall be constructed of 4-inch nominal diameter galvanized iron pipe 3-feet high set a minimum of 3-feet into the ground with a fence post cap. The post hole and the pipe shall be filled with Class "B" concrete. The posts shall be installed in locations that provide the offsets called for herein and 18-inches clearance to the nearest point on the hydrant. The posts shall be so situated as to protect the hydrant from any direction traffic may be expected. Each post shall be painted to match the fire hydrant.

All hydrants shall be set in a pad of Class "B" concrete not less than 36-inches square and 6-inches thick. In sidewalk areas, the sidewalk shall be thickened and widened as necessary to conform with these requirements. The hydrant shall be set such that the top flange of the first buried spool below the breakaway spool is no less than 1-1/2 inches and no more than 2-inches above the pad. Bolts shall be inserted from the top down with the nuts on the underside of the flange. In pouring concrete for the pad, the bolts shall be protected from any concrete and shall not be permitted to extend closer than 1/8-inch to the surface of the pad. All bolt ends shall be painted with a coat of bitumastic type material (Protecto Wrap 160/160H, Tapecoat Brush-Applied Coating, or approved substitute).

The breakaway bolts shall be installed with the nut down and the hole sealed with either a bitumastic compound or silicon caulk. Break off spools having only one groove eccentrically located shall be installed with the groove at the low end of the spool.

Upon completion of the installation of the fire hydrant, the Contractor shall assist the Engineer in performing a flow test of the hydrant. Such assistance shall include but not be limited to

hoses, nozzles, and directing the flow to a safe discharge point. The Engineer shall take all measurements related to the measurement of flow.

Hydrostatic testing and disinfection shall be accomplished in accordance with the provisions of [Section 3-B.02, "Transmission and Distribution Pipelines", \(E\) Pipeline Construction, Fabrication, and Installation \(6\) Hydrostatic testing](#) and [Section 3-B.02, "Transmission and Distribution Pipelines"\(E\) Pipeline Construction, Fabrication, and Installation \(7\) Flushing and Disinfecting](#) of these Standard Specifications.

(G) Measurement and Payment

The contract unit price per each for fire hydrant shall include full compensation for all labor, materials, equipment, and tools and for doing all work required in installing the fire hydrant including but not limited to, excavation, bedding, providing the hydrant, connection to the main pipeline, isolation valve, thrust restraint, hydrant pad, painting, breakaway bolts and spools, backfill, retaining wall, traffic barriers, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

3-B.10 Wharf Head Fire Hydrant

(A) General

Where provided for on the Project Plans, the Contractor shall install a wharf head fire hydrant for the purposes of obtaining water from the distribution system. Said wharf head hydrants shall not normally be considered acceptable for fire suppression purposes.

(B) Materials

The wharf head fire hydrant shall be a bronze plug valve style unit designed to operate at service pressures of 150-psi minimum. The valve shall be bronze body and equipped with a tapered valve seat, operating nut, brass hose cap and attendant chain. The body of the valve shall be equipped with a 4-inch diameter inlet threaded FIPT and a 22-inch diameter hose port threaded National Hose Thread.

(C) Representative Model

The wharf head fire hydrant shall be Model J-344HP as manufactured by the James Jones Company or approved substitute.

(D) Construction

The Contractor shall make connection to the water distribution main in the manner shown in Standard Plan No. 9 – “Standard 4-inch or Large Fire Service Installation” of the District’s Standard Plans. The service lateral and riser shall be 4-inch diameter distribution pipeline in accordance with [Section 3-B.02, “Transmission and Distribution Pipelines”](#) of these Standard Specifications.

The riser shall be 4-inch diameter ductile iron pipe to point 6-inches above final grade. The riser above grade shall be 4-inch GIP (FL x Thrd) in accordance with Section 3-03.05, “Iron Service Piping” of these Standard Specifications. The riser shall transition to 4-inch diameter GIP by the use of a flange coupling adaptor in accordance with [Section 3-B.04, “Fittings” \(F\) Flange-Coupling Adapters and Make-Up Spools](#) of these Standard Specifications and a threaded flange on the GIP. Final elevation above grade shall be a minimum of 30-inches and a maximum of 36-inches.

All exposed threads shall be cleaned of all deleterious material and machine oil and liberally coated with a zinc rich cold galvanizing compound (Rust-Oleum® Model V2185 or approved substitute).

(E) Measurement and Payment

The contract unit price per each for Wharf Head Fire Hydrant shall include full compensation for all labor, materials, equipment, and tools and for doing all work required in installing the Wharf Head Fire Hydrant including but not limited to, excavation, bedding, providing the hydrant, connection to the main pipeline, isolation valve, thrust restraint, hydrant pad, painting, breakaway bolts and spools, backfill, retaining wall, traffic barriers, and pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

3-B.11 Pipe Assembly Enclosures

(A) Description

Where provided for on the Project Plans and for all above grade installations including but not limited to, cross-connection control devices, fire services, and flow control valves, the Contractor shall install a protective enclosure around the pipe assembly. Said pipe assembly enclosure shall be fabricated with a steel frame and expanded metal body and be lockable.

Each pipe assembly enclosure shall be designed to conform to the loading requirements of the American Society of Sanitary Engineers Standard No. 1060 for a 100-psf load.

(B) Materials

(1) Frame - The pipe assembly enclosure frame shall be fabricated of Sch. 40 steel pipe or Type 304 stainless steel tubing rolled to form the dimensions of the enclosure. The base shall be fabricated of A36 mild steel or Type 304 stainless steel structural angle shape stock. A locking lug shall be supplied either on one end or, in the case of two or more sections, at the center of the enclosure opposite the hinges. Two hinges shall be fabricated of the same material as the frame and located at the end of the enclosure opposite the locking lug.

(2) Enclosure - The enclosure shall be fabricated of diamond pattern flat rolled expanded metal of the dimensions of the enclosure. Expanded metal shall be mild steel or Type 304 stainless steel.

(3) Assembly - The enclosure shall be fabricated in the shop by machine welding of each component in accordance with the manufacturer's recommendations. Upon completion of fabrication, all mild steel pipe assembly enclosures shall be coated with a heat applied powder coat finish in Forest Green color unless other colors are called for in the Contract Documents.

(4) Insulation - Each enclosed installation shall be equipped with an insulating blanket of sufficient dimension to fully cover the piping assembly without interfering with the operation of the enclosure itself. Insulating blankets shall be of a Forest Green color and be provided with at least one pair of locking grommets. The blanket shall be fabricated of a polymeric resin coated fabric. Insulation shall be R-13 compressed fiberglass.

(C) Representative Models

Pipe assembly enclosures for piping assemblies shall be GuardShack® or Coast GuardShack® as manufactured by Backflow Prevention Device Enclosures (BPDI) of Phoenix, Arizona or approved substitute. Insulating blankets shall be Weatherguard® or FrostGuard® or approved substitute.

(D) Construction

The pipe assembly enclosure shall be constructed after all piping work is completed. The Contractor shall construct a Portland cement concrete slab around the piping installation to support the enclosure. The slab shall be a minimum of 4-inches in thickness and the outside dimensions shall be a minimum of 6-inches beyond the outside dimension of the enclosure. The slab shall be reinforced at mid-depth with #4 reinforcing steel (Grade 40) laid at 12-inches on center each way. The enclosure shall be attached to the slab with tamperproof stainless

steel bolts in accordance with the manufacturer's recommendations. All pipe penetrations shall be sleeved with a PVC pipe sleeve (Sch. 40 or Class 125) one size larger than the pipe.

A padlock will be provided by the Owner.

(E) Measurement and Payment

Unit Basis - When pipe assembly enclosures are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing pipe assembly enclosures including but not limited to, excavation, bedding, Portland cement concrete slab, providing and attaching the enclosure, and insulating blanket, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for pipe assembly enclosures is not included in the Contract Documents, all costs for such pipe assembly enclosures as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such pipe assembly enclosures shall be included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

END OF DOCUMENT

3-C RECYCLED WATER SYSTEM**3-C.01 General Requirements****(A) Operating Pressure Requirements**

Whenever practicable, all areas within the Recycled water distribution system shall be designed to provide a static head at least 20-feet (9 psi) less than adjacent potable water distribution system elements; providing however that the minimum static head shall be 70-feet (30 psi) and that the maximum static head be not more than 185-feet (80 psi).

(B) Recycled Water Distribution System Layout

All pipe lines within the Recycled water distribution system shall be constructed at the locations provided for on the approved Project Plans. Except as expressly permitted by the Engineer, all new pipelines shall be installed in the public right-of-way. In the absence of public right-of-way within the project limits, pipelines shall be installed in private rights-of-way. The actual location of the pipelines shall be approved by the Engineer prior to issuing the plans for construction. All pipelines and appurtenances shall have the proper easements to enable full access by the District for future maintenance operations.

The Recycled water transmission system is essentially a linear (non-looped) system with supply originating at the District's Recycled Water Treatment Plant located near Lundy Lane and Whispering Pines Drive. The two primary transmission mains extend from the treatment plant northeasterly in Scotts Valley Drive and Glenwood Drive, and northwesterly generally paralleling Mount Hermon Road. A terminal reservoir is located to the west of the Scotts Valley High School campus off of Glenwood Drive.

The District has three (3) locations within the District boundaries for construction water to be conveyed to construction water truck to collect water for construction purposes.

(C) Minimum Pipe Size

The minimum pipe size within the distribution system shall be 3-inch inside diameter.

(D) Valve Type and Spacing

All valves smaller than 10-inch diameter shall be resilient wedge type gate valves. All valves 10-inch and larger shall be butterfly type. Valves shall be spaced at intervals not exceeding 500-feet in all distribution systems. Where a continuous run of pipe does not exceed 600-feet, an intermediate valve may not be required. Valves on continuous runs of pipe shall be located at the projection of property lines and at intervals that divide the total length as evenly as possible.

Valves shall be located on each branch of a three-way and four-way intersection, at each blow-off assembly and where otherwise directed by the Engineer. Valves shall be installed on the fitting at the main pipeline in each instance. Valves shall also be located at each end of pipelines crossing private property through easements, casings, major stream or channel crossings, at the projected property lines of hospitals, schools, and major industrial users.

(E) Air and Vacuum Valves

Combination air and vacuum release valves shall be installed at each high point in the pipeline where air can be trapped during filling of the pipelines. All combination air and vacuum release valves shall be installed in accordance with District's Standard Detail No. 24 "Air Valve Installation".

(F) Blow-Off Valves

Blow-off valves shall be installed at each low point in the pipeline to facilitate flushing of the pipeline. Blow-off valves shall also be installed at the terminus of all temporary and permanent dead ends. All blow-off valves shall be installed in accordance with District's Standard Detail No. 23 "Blow Off Installation".

(G) Minimum Trench Dimensions

All Recycled water pipelines shall be designed for a minimum pipe coverage based on the values found in [Table 4-01 Minimum Trench Dimensions](#) of these Standard Specifications.

All pipelines shall be designed to be constructed at the minimum depth whenever possible. Any deviation from the minimum depth shall be done as gradually as possible with the minimum of fittings and approved by the Engineer in advance.

TABLE 4-01
Minimum Trench Dimensions

Pipe Diameter	Trench Width	Depth of Cover
3-inch 4-inch 6-inch	18-inches	36-inches
8-inch	20-inches	42-inches
14-inches and larger	Diameter 18-inches	48-inches or As Directed

(H) Connections

All service connections shall be made in accordance with these Standard Specifications and Standard Plans and the direction of the Engineer. Multiple connections will not be allowed. The District will furnish and install the meter.

California Administrative Code. All services for the purpose of supplying Recycled water shall be subject to this review.

The property owner shall be fully responsible for the installation of cross-connection control devices on any potable water connections serving the property as provided in [Section 3-B.01, “General Requirements”](#) (K) [Cross-Connection Control](#) of these Standard Specifications. Such owner shall maintain the assembly in accordance with the District’s Backflow Preventions and Cross-Connection Policy, Rules and Regulations for Recycled Water Customers, the California Health and Safety Code, the California Water Code, Titles 22 and 17 of the California Code of Regulations, and other applicable ordinances, policies and procedures adopted by State and local jurisdictions.

3-C.02 Recycled Water Transmission and Distribution Pipelines

(A) Description

All pipelines constructed for the purpose of conveying Recycled water from a source, storage facility, pumping facility, or treatment facility to the point of use shall be defined as transmission and distribution pipelines. This definition shall also include but not be limited to, piping assemblies at such facilities and services 3-inch and larger to the meter. Unless specifically indicated otherwise on the Project Drawings or allowed by prior written permission of the District, all transmission and distribution pipelines shall be constructed using polyvinyl chloride (PVC) pipe.

Services smaller than 3-inch, fittings, valves, and appurtenances shall be installed and constructed in accordance with other sections of these Standard Specifications and the Contract Documents.

Except as specifically shown on the Project Plans or otherwise indicated in this Division 4, "Recycled Water System", all Recycled water facilities shall conform to the requirements of Division 3, "Potable Water System".

(B) Poly Vinyl Chloride (PVC) Pipe

(1) General - All polyvinyl chloride (PVC) pipe shall be cast-iron equivalent outside diameter with push-on bell type joints. Each joint shall be equipped with one elastomeric gasket. Each full length of pipe (20-feet) shall be provided with one bell type joint. Where provided for in the Contract Documents, PVC pipe shall be equipped Certa-Lok restrained joints as manufactured by CertainTeed Corporation. Each joint shall be equipped with one elastomeric gasket and the grooved restraint system of the C900/RJ Restrained Joint PVC System as manufactured by CertainTeed Corporation.

Pipe wall thickness by pressure class and dimension ratio shall be as found in [Table 4-02 PVC Pipe Pressure Class](#) of these Standard Specifications.

**TABLE 4-02
PVC Pipe Pressure Class**

Pressure Class	Dimension Ratio (DR)
100	Not Permitted
150	18
200	14

(2) Pipelines 12-inch Diameter and Smaller - Except as provided for in the Contract Documents, all transmission and distribution water mains 12-inches in diameter and smaller shall be constructed of polyvinyl chloride (PVC) pipe in accordance with the requirements of AWWA C900.

(3) 14-inch Diameter and Larger - Except as provided for in the Contract Documents, all transmission and distribution water mains 14-inches in diameter and larger shall be constructed of polyvinyl chloride (PVC) pipe in accordance with the requirements of AWWA C905.

(4) Pipe Color - All pipe materials shall be manufactured with an ultraviolet protecting pigment. Pipe materials for Recycled water systems shall be pigmented in purple including bell couplings.

(C) Ductile Iron Piping

The use of Ductile Iron pipe shall be limited to above ground assemblies and pump suction barrels as provided in [Section 3-C.02 "Recycled Water Transmission and Distribution Pipelines"](#) [\(C\) Ductile Iron Piping](#) of these Standard Specifications.

(D) Pipeline Construction, Fabrication, and Installation

The Contractor shall bear full responsibility for safety related to his trenching operations in accordance with Section 5-A "General Conditions" Public Safety and Convenience. All pipeline construction, fabrication, and installation shall conform to the requirements of [Section 3-C.02, "Recycled Water Transmission and Distribution Pipelines" \(D\) Pipeline Construction, Fabrication, and Installation](#) of these Standard Specifications.

(E) Locator Wire

A wire to be used for future subsurface location shall be installed concurrent with pipe laying operations as provided in [Section 3-C.02, "Recycled Water Transmission and Distribution Pipelines" \(E\) Locator Wire](#) of these Standard Specifications.

(F) Hydrostatic Testing

Upon completion of pipeline construction, the Contractor shall conduct hydrostatic testing in conformance with the provisions of [Section 3-C.02, "Recycled Water Transmission and Distribution Pipelines" \(F\) Hydrostatic Testing](#) of these Standard Specifications.

(G) Flushing

Flushing and disinfection of Recycled water distribution pipelines shall conform in all respects to the procedures and requirements set forth in [Section 3-C.02, "Recycled Water Transmission and Distribution Pipelines" \(G\) Flushing](#) of these Standard Specifications.

(H) Measurement

Quantities of Recycled water distribution pipeline will be measured to the nearest 1 linear foot increment or portion thereof along the centerline of the pipeline as constructed. Except as provided for in the Contract Documents, all fittings and thrust restraint systems installed as part of such pipeline shall be considered as incidental to the construction of such pipelines and no additional compensation will be allowed therefor.

Except as provided for in the Contract Documents, quantities of pipeline constructed as part of pipeline assemblies including but not limited to, that piping for wells, booster stations, and tanks shall be considered as incidental to the construction of such piping assemblies and no additional compensation will be allowed therefor.

(I) Payment

The contract unit price paid per linear foot for Polyvinyl Chloride (PVC) pipe or the contract lump sum price paid for piping assemblies shall include full compensation for furnishing all labor, tools, equipment, materials, and incidentals and for doing all work involved in construction of the pipeline complete in place, including but not limited to, excavation, bedding, backfill, pavement repair, handling and transportation, thrust restraint, fittings, corrosion protection, disinfection, flushing, and hydrostatic testing as specified in these Standard Specifications and as provided for in the Contract Documents and no additional compensation will be allowed therefor.

3-C.03 Service Pipe Materials

(A) Description

Service pipe materials shall be defined as all pipe and tubing necessary to convey Recycled water from a transmission or distribution pipeline to the point of use. Service pipe materials shall also include all pipe and tubing included as a portion of or integral to appurtenances, pumps, and tanks and all fittings necessary for the construction or installation of service pipe materials. All service pipe materials, fabrication, and installation shall be in accordance with [Section 3-C.03, "Service Pipe Materials"](#) of these Standard Specifications.

Except as provided elsewhere herein or in the Contract Documents, all pipeline and services larger than 3-inch in diameter shall be provided, constructed or installed as provided for in [Section 3-C.02, "Recycled Water Transmission and Distribution Pipelines"](#) of these Standard Specifications.

3-C.04 Fittings

(A) Description

All fittings for Recycled water distribution pipelines and piping assemblies shall be in accordance with [Section 3-C.04, "Fittings"](#) of these Standard Specifications.

(B) Joints

Joints on fittings used in subsurface installations of transmission and distribution pipelines shall be mechanical joint, restrained joint (Tyton® with Field-Lok®) as provided for in the Contract

Documents, conforming to the requirements of AWWA C111 and [Section 3-C.04, "Fittings" \(B\) Joints](#) of these Standard Specifications.

(C) Construction

Assembly and installation of fitting shall in accordance with the manufacturer's recommendations and [Section 3-C.04, "Fittings" \(C\) Construction](#) of these Standard Specifications.

3-C.05 Thrust Restraint

(A) Pipelines

All pipelines and piping assemblies shall be restrained against the hydrostatic and hydrodynamic forces inherent within pressure water supply and distribution systems. Thrust restraint shall be accomplished by the use of mechanically restrained joints, restraint harness, or cast-in-place Portland cement concrete thrust blocks.

(B) Mechanically Restrained Joints

All mechanical joint fittings and pipe shall conform to the requirements of [Section 3-C.05, "Thrust Restraint" \(B\) Mechanically Restrained Joints](#) of these Standard Specifications.

(C) Portland Cement Concrete Thrust Blocks

Where provided for in the Contract Documents, the Contractor shall construct Portland cement concrete thrust blocks to restrain hydraulic forces. Thrust blocks shall be in accordance with Standard Plan 19, "Thrust Block Installation" and [Section 3-C.05, "Thrust Restraint"](#) of these Standard Specifications.

(D) Measurement and Payment

Except as provided for in the Contract Documents, thrust restraint shall be considered as incidental to other items of work and all costs shall be included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

3-C.06 Bolting Procedures

(A) Description

All fittings, joints, assemblies, valves, and miscellaneous special fittings shall be installed in accordance with procedures and requirements of [Section 3-B.06, "Bolting Procedures"](#) of these Standard Specifications.

3-C.07 Casing and Duct Installations

(A) Description

Where provided for in the Contract Documents, the Contractor shall install the water main or service piping within a steel casing or other ducting. Such installations shall include but not be limited to, freeway crossings, railway crossings, stream crossings, installations adjacent to structures, and service piping related to other facilities such as pumping and treatment plants. The Recycled water pipeline or service piping shall be known as the carrier pipe for the purposes of this [Section 3-B.02, "Recycled Water Transmission and Distribution Pipelines"](#) of these Standard Specifications.

All casing and duct installations shall conform to the procedures, requirements, and specifications contained in [Section 3-B.07, "Casing and Duct Installations"](#) of these Standard Specifications.

(B) Measurement

Quantities of casing installation will be measured by the linear foot to the nearest 1-foot increment or portion thereof along the centerline of the pipeline casing as constructed. Except as provided for in the Contract Documents, all pipelines, fittings, and thrust restraint systems installed as part of such casing installation will be paid for under the contract unit or lump sum price for pipelines or other items of work and no additional compensation will be allowed therefor.

(C) Payment

The contract unit price per linear foot for "Install Casing" or "Install Duct" shall include full compensation for furnishing all labor, tools, equipment, materials, and incidentals and for doing all work involved in installing casings and ducts including but not limited to excavation, boring, jacking, casing, welding, ducting, installing carrier pipe, insulators, seals, bedding, and backfill complete in place as shown in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

3-C.08 Valves**(A) Description**

Valves shall be as specified in 3-B.08, "Valves" of these Standard Specifications.

(B) Measurement and Payment

(Unit Basis - When valves are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials,

equipment, and tools and for doing all work in installing gate valves including but not limited to, excavation, bedding, supports, providing the valve, connection to the pipeline or fitting, valve box, backfill, an pavement repair, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for valves is not included in the Contract Documents, all costs for such gate valves as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such gate valves shall be included in the contract unit or lump sum prices for other items of work and no additional compensation allowed therefor.

3-C.09 Pipe Assembly Enclosures

(A) General

Where provided for on the Project Plans and for all above grade installations including but not limited to, cross-connection control devices and flow control valves, the Contractor shall install a protective enclosure around the pipe assembly. Said pipe assembly enclosure shall be in accordance with the requirements of 3-C.09, "Pipe Assembly Enclosures" of these Standard Specifications.

(B) Measurement and Payment

Unit Basis - When pipe assembly enclosures are provided for in the Contract Documents to be paid for as a unit, the contract unit price per each shall include full compensation for all labor, materials, equipment, and tools and for doing all work in installing pipe assembly enclosures including but not limited to, excavation, bedding, Portland cement concrete slab, providing and attaching the enclosure, and insulating blanket, complete in place as provided for in the Contract Documents, as provided for in these Special Provisions, and as directed by the Engineer and no additional compensation will be allowed therefor.

Incidental Basis - When a pay item for pipe assembly enclosures is not included in the Contract Documents, all costs for such pipe assembly enclosures as are provided for in the Contract Documents shall be considered as incidental to other items of work and all costs associated with such pipe assembly enclosures shall be included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

END OF DOCUMENT

3-D SITE WORK**3-D.01 Bedding, Backfill, and Aggregate Bases****(A) Description**

Bedding shall be that material placed to a minimum depth of 4-inches below and 12-inches above all pipe, fittings, valves, and structures. Backfill shall be that material used to fill trenches and excavated areas above the depth of the bedding. Aggregate base shall be that material placed immediately below all paved surfaces and may be used as the final paving surface where provided for in the Contract Documents. All bedding, backfill and aggregate base shall be in accordance with these Standard Specifications, the Contract Documents, and the requirements of agencies having jurisdiction over the work.

(B) Sand Bedding

Except as provided for in the Contract Documents, bedding material shall be clean, washed, granular material derived from decomposed or crushed rock. Such material shall be free of organic material, mica, clay, silt, oils, and other deleterious material. Sand bedding shall have a maximum particle size of 1/4-inch with a gradation that allows 90 to 100 percent to pass a No. 4 sieve and 80 to 95 percent to pass a No. 8 sieve and not more than 5 percent to pass a No. 200 sieve.

3-D.02 Backfill**(A) General**

Except as provided for in the Contract Documents, the minimum backfill required within the District shall be as follows:

Longitudinal trenches	Sand
Transverse trenches	1-sack Sand/Cement Slurry (including but not limited to main crossings and service lines)
Structure excavations	2-sack Sand/Cement Slurry (including but not limited to, valves, meters, and vaults)

Unimproved areas not subject to vehicle travel

All excavations	Native Material (min. Sand Equivalent of 20)
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Unimproved areas subject to vehicle travel

All excavations	Sand
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At the Contractor's option and subject to the prior approval of the Engineer, the Contractor may use backfill materials of a higher grade than that shown herein. Except as provided for in the Contract Documents, no additional compensation will be allowed for the use of materials of a higher grade than these minimum requirements.

3-D.03 Sand Backfill**(A) Sand Backfill**

Sand backfill shall be a clean, washed, granular material conforming with the requirements of Section 3-D.03, "Sand Backfill" of these Standard Specifications.

(B) Crushed Aggregate Backfill

Crushed aggregate backfill shall be a crushed gravel or rock material free from organic material, mica, clay, silt, oils, and other deleterious material. For trench backfill, the maximum particle size shall be 3-inches and the gradation shall otherwise conform with the following:

Minimum Sand Equivalent	20
<u>Sieve Sizes</u>	<u>Percentage Passing</u>
3-inch	100
No. 4	35-100
No. 30	20-100

At the Contractor's option and subject to the approval of the Engineer, the Contractor may substitute aggregate base material otherwise conforming with [Section 3-D.04, "Aggregate Bases"](#) of these Standard Specifications.

(C) Permeable Backfill

Permeable backfill shall be a poorly graded gravel or crushed rock meeting the following minimum gradation:

Class 1, Type B

<u>Sieve Sizes</u>	<u>Percentage Passing</u>
2-inch	100
1-1/2 inch	95-100
3/4-inch	50-100
1/2-inch	---
3/8-inch	15-55
No. 4	0-25

No 8.....	0-5
No. 200.....	0-3
Durability Index.....	≥40
Sand Equivalent.....	≥75

The Contractor shall submit gradation curves and laboratory analysis for any permeable material required by these Standard Specifications and the Contract Documents as well as any permeable material proposed to be used that doesn't otherwise meet these requirements.

(D) Sand/Cement Slurry Backfill

Sand/cement slurry backfill shall consist of a fluid, workable mixture of aggregate, cement, and water. Aggregate for sand/cement slurry shall be a clean, washed fine aggregate conforming with the provisions of [Section 3-D.03, "Sand Backfill"](#) of these Standard Specifications.

Alternatively, fine aggregate may be clean mortar sand conforming with the provisions of ASTM C404. Cement shall be Type IP or Type II Modified in accordance with Section 3-B.05, "Portland Cement" of these Standard Specifications. Water shall be clean, potable water free of organic contaminants, oils, salts, or other deleterious materials.

(E) Controlled Density Fill (CDF)

Where provided for in the Contract Documents, trench backfill shall consist of Controlled Density Fill. CDF shall be an aggregate and water slurry with additives of Portland cement and pozzolan in accordance with the following mix design:

Design Strength.....	50-150 psi
Portland cement (Type II (ASTM C150))	40 lbs/CY
Pozzolan (International Class F (ASTM C 618))	202 lbs/CY
Total material (3.00 sacks/CY)	282 lbs/CY
Water/cement ratio	N/A
Coarse Aggregate	None
Fine Aggregate	San Benito Sand
Entrained Air	4.0-percent, dosage = 2 ox/cwt. (Daravair)

(Dosage may vary to attain desired air)

Chemical Admixture.....None

Proportions (Per Cubic Yard)

Ingredient	Volume (ft)	Weight (lbs)
Cement	0.41	80
Pozzolan	1.40	202
Water	7.34	4581
Air	1.08	0.0874
Fine Aggregate	16.77	2,731
Totals	27.00	3,471

3-D.04 Aggregate Bases

Aggregate base and subbase material shall be crushed rock or gravel free from organic material, oils, and other deleterious substances.

Aggregate base material for use under paved surfaces shall be Class 2 conforming with the following gradation:

Minimum Sand Equivalent.....25

Minimum Resistance (R-value)78

Minimum Durability Index35

Z Percentage Passing

<u>Sieve Sizes</u>	<u>1 ½" Max</u>	<u>¾" Max</u>
2-inch	100	
1 2-inch	90-100	
1-inch		100
¾-inch	50-85	90-100
No. 4	25-45	35-60
No. 3-0	10-25	10-30
No. 200	2-9	2-9

3-D.05 Installation and Construction**(A) General**

All bedding, backfill, and aggregate base material shall be delivered to the work areas in such a manner as to protect them from the introduction of organic material, oils and salts, native soils, cement, and concrete and other deleterious materials. The Contractor shall bear full responsibility for the transportation of materials including but not limited to, weight limits, vehicle dimensions, vehicle condition, and load covers.

Upon arrival at the work area, materials shall be incorporated into the work as soon as practicable. Materials not immediately incorporated into the work shall be stored in a suitable area where the material shall be protected from the introduction of any deleterious materials. The storage area shall be protected from traffic at all times except as required for the delivery of materials or work related to their incorporation into the work.

The Contractor shall provide such measures as may be required by the field conditions to prevent such conditions as, but not limited to, excessive dust, ponding of water, rerouted runoff that causes erosion, unsafe conditions, and any other condition that poses a hazard to the public or the quality and sufficiency of the material.

(B) Moisture Conditioning

The Contractor shall bring the bedding, backfill, and aggregate base material to the optimum moisture content as determined from laboratory analysis of the samples provided for in Section 6-D, "Submittals" of these Standard Specifications.

Adjustments to the moisture content shall be a means selected by the Contractor that will ensure full and even distribution of moisture throughout the material. Such means shall include but not be limited to, windrowing, irrigating, misting, spreading, and sprinkling. Except as provided for in the Contract Documents, jetting and ponding will not be permitted. Jetting is hereby defined as the injection of large volumes of water directly into the material with a nozzle under pressure. Ponding is hereby defined as flooding the work area with water to facilitate moisture content and compaction.

(C) Bedding

Bedding shall be placed in the trench in such a manner as to prevent the introduction of deleterious materials. The trench shall be cleared of all loose native soils, debris, trash, and water and the sand bedding spread in a smooth layer to the required depth. The bedding shall

then be compacted to 90-percent relative density by the use of vibratory plate compaction equipment. The Contractor may use alternative equipment to achieve compaction subject to the prior approval of the Engineer. Such approval shall require the Contractor to demonstrate to the Engineer's satisfaction that the proposed method will achieve the required compaction without jeopardizing the integrity of the rest of the improvements being constructed.

After installing the pipe or structure, the Contractor shall place bedding material on both sides of the pipe to the spring line. The bedding shall be thoroughly worked under the haunches of the pipe and hand tamped or compacted with a piston type compaction tool to achieve a 90-percent relative density. Care shall be taken to prevent displacing the pipe by placing more material on one side than the other. Care shall be taken to prevent dropping heavy loads of material directly on the pipe.

Before proceeding with the next lift of bedding, the material along the pipe shall be thoroughly tamped to achieve 90-per cent relative compaction, taking care to prevent damage or displacement of the pipe. The material shall be compacted using a piston type compaction tool and hand tamping. Extra water may be used, above that necessary for optimum moisture content, to facilitate full bearing contact and compaction. Jetting and ponding will not be permitted.

Upon completion of placing and compacting bedding to the top of the pipe, sand bedding at the optimum moisture content shall be placed in one lift to a depth of 12-inches and spread uniformly throughout the trench. The bedding shall then be compacted by vibratory plate compaction equipment to a relative density of 90-percent. The Contractor may use alternative equipment to achieve compaction subject to the prior approval of the Engineer. Such approval shall require the Contractor to demonstrate to the Engineer's satisfaction that the proposed method will achieve the required compaction without jeopardizing the integrity of the rest of the improvements being constructed.

(D) Sand and Crushed Aggregate Backfill

After sand bedding has been brought to a depth of 12-inches over the pipe or the structure placed or constructed on the bedding, sand or crushed aggregate shall be placed in lifts not to exceed 8-inches in depth at the optimum moisture content and compacted by vibratory plate compaction equipment to a relative density of 95-percent. The Contractor may use alternative equipment to achieve compaction subject to the prior approval of the Engineer. Such approval shall require the Contractor to demonstrate to the Engineer's satisfaction that the proposed method will achieve the required compaction without jeopardizing the integrity of the rest of the improvements being constructed. Each lift shall be adequately compacted prior to placing

the next lift of backfill. Backfill shall be brought to a minimum depth of 6-inches below the final paving surface.

(E) Native Backfill

Native backfill shall be constructed in the same manner as provided for in [Section 3-D.03 "Sand Backfill"](#), [\(B\) Crushed Aggregate Backfill](#) of these Standard Specifications. Except as provided for in the Contract Documents, native backfill shall be compacted to 95-percent relative density and continued to a depth of 6-inches above the surrounding ground surface. Provision shall be made to prevent adverse runoff conditions from developing as a result of the final surface plane of the trench. The Contractor shall install such erosion control measures as water bars and berms as are necessary to prevent erosion of the backfill surface.

The surface shall then be seeded with a mix conforming with Santa Cruz County Erosion Control Mix or restore any landscaping to an equal or better condition than found prior to commencing work.

(F) Sand/Cement Slurry Backfill and CDF

Where called for in the Contract Documents or when approved by the Engineer, sand/cement slurry backfill may be placed to the full depth of the trench without first constructing a sand bedding. In such cases, the pipe or structure shall be supported on blocks as provided for elsewhere in these Standard Specifications or the Contract Documents.

The trench shall be cleared of all debris, loose soils, trash, and other deleterious material immediately prior to placing the sand/cement slurry backfill.

The Contractor shall place an anchor of sand/cement slurry over the pipe at intervals not to exceed 10-feet to prevent floating the pipe. Sand/cement slurry shall then be placed in such a manner as to ensure full contact with the pipe or structure and complete filling of all void spaces under the pipe or structure. The sand/cement slurry shall be shoveled and rodded or vibrated until there is evidence that the void is filled. After placing either sand bedding or sand/cement slurry bedding, as provided for in the Contract Documents or approved by the Engineer, the Contractor shall place the sand/cement slurry backfill in the trench or excavation.

The trench or excavation shall be filled to the surface less the thickness of the final paving surface in one continuous operation. The sand/cement slurry shall be shoveled and rodded to ensure full contact with the walls of the trench or excavation. At the Contractor's option and subject to the approval of the Engineer, the sand/cement slurry may be brought to the surface and then excavated later to permit placement of the final paving surface.

Upon completion of backfilling operations, the Contractor shall place steel plates over the trench or excavation for a minimum period of 24-hours or that time provided for in the Contract Documents. The plates shall be fabricated of steel conforming with ASTM A36 and a minimum of 1-inch thick and capable of supporting an H20 traffic load. The plates shall extend a minimum of 2-feet on each side of the trench or excavation. The plates shall be so placed as to prevent rocking or displacement due to traffic and the edges shall be sealed with cold-mix asphalt paving material. The cold mix shall be so placed as to provide a smooth transition on to and off of the plates.

The Contractor shall protect the sand/cement slurry surface from damage due to traffic, construction operations, and weather until such time as the final paving may be constructed. Paving operations shall not commence prior to 7-days following placement of sand/cement slurry or CDF to permit shrinkage to achieve equilibrium in the final trench backfill.

(G) Aggregate Base

Upon completion of backfilling operation, the Contractor shall construct an aggregate base to a minimum depth of 8-inches below the underside of the final paving surface or that depth called for in the Contract Documents. In no case shall the depth of aggregate base be less than that of the existing pavement section. The Contractor shall protect the aggregate base surface from damage due to traffic, construction operations, and weather until such time as the final paving may be constructed.

3-D.06 Paving

(A) Description

The Contractor shall pave or repave all road surface within public rights-of-way, private rights-of-ways, driveways, drainage courses, and other surfaces as provided for in the Contract Documents. Except as provided for in the Contract Documents, all paving materials shall be constructed of asphalt concrete or an asphaltic emulsion, with or without aggregate.

3-D.07 Asphalt Concrete Pavement

(A) General

Asphalt concrete pavement shall be in accordance with the provisions of [Section 3-D.07, "Asphalt Concrete Pavement"](#) of these Standard Specifications. Except as provided for in the Contract Documents, a Certificate of Compliance in accordance with Section 6-B Information and Procedures Instructions "Certificates of Compliance" of these Standard Specifications shall be submitted in lieu of the testing and reporting requirements of the CALTRANS Standard Specifications.

(B) Aggregate

Except as provided for in the Contract Documents, all asphalt concrete used in the construction of asphalt concrete pavements shall be Type "B" meeting the gradation requirements for 2-inch maximum, medium of [Section 3-D.04, "Aggregate Bases"](#) of these Standard Specifications.

(C) Asphalt Binder

Asphalt binder for asphalt concrete shall be a steam refined asphalt, Grade AR4000, conforming with the requirements of Section 92, "Asphalts" of the CALTRANS Standard Specifications. The percentage of asphalt binder in asphalt concrete pavement shall be between 5-1/2 percent and 6 percent by weight.

3-D.08 Cold-Mix Asphalt Concrete**(A) General**

Cold-mix asphalt concrete used in temporary paving applications shall be a plant mixed product conforming with the requirements of this [Section 3-D.08, "Cold-Mix Asphalt Concrete"](#) of these Standard Specifications. Cold-mix may be supplied directly from the batch plant or stockpiled on the job-site.

(B) Aggregate

Aggregate shall meet the following gradation requirements:

Sieve Size	Percentage Passing
1/2-inch	100
3/8-inch	95-100
No. 4	58-72
No. 8	34-48
No. 3-01	8-32
No 50	13-23
No. 200	2-9

(C) Asphalt Binder

Asphalt binder for cold-mix shall be Type SC-800 in accordance with the requirements of Section 93, "Liquid Asphalts" of the State Specifications. The percentage of asphalt binder shall be between 4.8 and 7.5 percent.

3-D.09 Paint Binder and Prime Coat**(A) General**

Paint binder (tack coat) shall be applied to the vertical surface of all structures to which new asphalt concrete will abut. Additionally, where the Contract Documents provide for the placement of new asphalt concrete over existing pavement surfaces, a tack coat shall be applied to the surface of the old pavement. Where called for in the Contract Documents, the surface of aggregate base shall receive a prime coat of liquid asphalt immediately prior to commencing paving operations.

(B) Paint Binder (Tack Coat)

Paint binder shall be Type RS-1 asphaltic emulsion conforming with the provisions of [Section 3-D.07, "Asphaltic Concrete Pavement"](#) of these Standard Specifications.

3-D.10 Miscellaneous Areas**(A) General**

Miscellaneous areas shall be those areas or structures called for in the Contract Documents to be surfaced or constructed of asphalt concrete. Such areas shall include but not be limited to, drainage ditches, equipment pads, walkways, and asphalt dike.

(B) Materials

The gradation of aggregate for surfacing of miscellaneous areas shall be in accordance with [Section 3-D.07, "Asphalt Concrete Pavement"](#) of these Standard Specifications. The percentage of asphalt binder shall be increased by 1-percent by weight over that percentage for asphalt concrete placed in roadways.

(C) Asphalt Dikes

Asphalt dikes shall be constructed to the line and grade provided for in the Contract Documents. Asphalt dikes whose continuous length exceeds 5-LF shall be constructed by the use of an extrusion machine.

3-D.11 Construction**(A) General**

Upon completion of all pipe construction, including but not limited to trench backfill and aggregate base, the contractor shall construct the final asphalt concrete surface. Such asphalt

concrete surface shall be of the same depth, or greater, as the existing surface material. In no case shall the new asphalt concrete be less than 2-inches in depth.

(B) Structures

All structures located within the limits of paving including but not limited to, valve boxes, manholes, monument boxes, and other adjustable structures shall be brought to the grade of the final paving plane prior to placing the final lift of asphalt concrete. Where the distance between the edge of the new pavement and the existing edge of pavement, existing curb or gutter lip, or asphalt dike is less than 2-LF, the existing pavement shall be removed and replaced to the edge of pavement, existing curb or gutter lip or asphalt dike.

Failure to bring all structures to the final plane of the pavement surface prior to placing the final lift of asphalt concrete may be cause for rejection of the paving and the Contractor shall then be directed to bring the structures to the proper plane and place an additional 1-inch lift of asphalt concrete, after proper preparation, all at no expense to the District.

(C) Preparation

All temporary paving material, loose aggregate base, and other deleterious material shall be removed from the trench line. as directed by the Engineer, a final pass shall be made with compaction equipment to ensure full compaction of the underlying surface. The surface of the aggregate base or sand cement slurry backfill and all abutting surfaces shall be prepared by spraying with a paint binder at a rate of 0.25 gallons per square yard. The Contractor shall prevent over spray onto adjacent pavement surfaces and other surfaces not scheduled to be paved. Paint binder shall not be tracked out of the trench line by vehicles or equipment.

(D) Placement

Hot asphalt concrete shall be placed in the area to be paved and compacted by the use of rollers or vibratory plate type compaction equipment. The use of vibratory plate compaction equipment shall be limited to projects whose area totals less than 100-SF and those areas on other projects where insufficient space is available for the operation of vibratory rollers. All spreading and compacting operations shall be in accordance with the provisions of [Section 3-D.07, "Asphalt Concrete Pavement"](#) of these Standard Specifications except that tolerances will be measured by the use of a straight edge of sufficient length to span the full width of the trench plus 2-feet on each side of the trench line.

If the total depth of asphalt paving exceeds 2-1/2 inches, the asphalt shall be laid in a minimum of 2 lifts with the maximum lift equaling 2-1/2 inches. the minimum thickness of any lift of asphalt shall be equal to twice the maximum size aggregate in the asphalt concrete mix. Each

lift shall be fully compacted and finished prior to placing the next lift except that the grade tolerances shall apply for the final lift only.

All new asphalt concrete surfaces shall be abutted to adjoining surfaces along a neat saw cut line. In no case shall new asphalt be feathered over existing surface material, placed against damaged surfaces, or over or against any material not adequately prepared as defined herein. The final surface of the asphalt concrete shall be no more than 1/8-inches above the adjacent existing surface nor shall the final surface be below the level of the adjacent surface. In areas of paving other than trench repairs, the plane of the surface shall not vary more than 1/8-inches above or below the average plane of the surface when measured with an 8-foot straight edge.

Skin patching shall not be considered an acceptable method of achieving the tolerances herein. Skin patching is hereby defined as a mix of asphaltic concrete whose maximum aggregate size is less than or equal to the No. 4 sieve used to fill depressions in the pavement plane.

The final lift of asphalt concrete shall be placed in one continuous operation as the final order of work for the project. Where trenches do not form an unbroken line throughout the project, asphalt concrete shall be placed in one continuous operation for each continuous trench.

All paving not conforming with the provisions of these Standard specifications, the Contract Documents, or any public agency having jurisdiction over the work shall be immediately removed and replaced in accordance with the provisions of these Standard Specifications, the Contract Documents, and the directions of such agencies having jurisdiction over the work.

3-D.12 Measurement

(A) Trench Repairs

Except as provided for in the Contract Documents, the costs associated with all asphalt concrete and other asphaltic products as part of trench repair or reconstruction shall be considered as included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

(B) Miscellaneous Areas

Except as provided for in the Contract Documents, the costs of all asphalt concrete and other asphaltic products used in the construction of miscellaneous areas shall be considered as included in the contract unit or lump sum prices for the construction of such miscellaneous areas and no additional compensation will be allowed therefor.

(C) Measurement by Area

Where provided for in the Contract Documents, asphalt concrete will be paid for by the square foot. The total area shall be calculated to the minimum neat line dimension of the improvements as provided for in the Contract Documents or as approved by the Engineer. Measurements of square footage of asphalt concrete surfaces shall be measured to the nearest 1 square foot.

(D) Measurement by Weight

Where provided for in the Contract Documents, asphalt concrete will be paid for by the ton. The tonnage to be paid for shall be calculated to the minimum neat line dimensions of the surface being paved, to the depth provided for in the Contract Documents or agreed to by the Engineer and Contractor. The tonnage of asphalt concrete per inch of compacted thickness shall be as provided for in [Table 5-01 Asphalt Spread Rate](#)¹ of these Standard Specifications.

(E) Payment

Where provided to be paid as a separate pay item, the contract unit price per ton or per square foot for asphalt concrete shall include full compensation for all labor, materials, equipment, and tools and for doing all work required in constructing asphalt concrete pavement including but not limited to, saw cutting and removing existing pavement, preparation of the underlying surface,, installation and compaction of baserock, tack coat, prime coat, hauling, traffic control, spreading, and compacting complete in place as provided for in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

3-D.13 Fog Seal**(A) Description**

Where provided for in the Contract Documents, the Contractor shall apply a fog seal that covers the repaved trench section and the adjacent street pavement. The Engineer shall determine the limits of the fog seal application. Such fog seal shall be constructed in accordance with the provisions of 37-1, "Seal Coats" of the CALTRANS Standard Specifications. The exact proportion of water to asphaltic emulsion shall be determined by the Contractor up to a maximum of one part water to one part asphaltic emulsion.

(B) Measurement

TABLE 5-01
Asphalt Concrete Spread Rate¹

Depth (inches)	Square Yards per Ton	Tons per Square Yard
1	17.64	0.057
1 - 1/2	11.76	0.085
2	8.82	0.113
2 - 1/2	7.35	0.142
3	5.88	0.170
4	4.41	0.227
5	3.53	0.284
6	2.94	0.340

¹ Assumes a unit weight of 150 lb/ft³ for asphalt concrete

(C) Trench Repairs

Except as provided for in the Contract Documents, the costs associated with fog seal application as part of trench repair or reconstruction shall be considered as included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

(D) Miscellaneous Areas

Except as provided for in the Contract Documents, the costs of fog seal application used in the construction of miscellaneous areas shall be considered as included in the contract unit or lump sum prices for the construction of such miscellaneous areas and no additional compensation will be allowed therefor.

(E) Measurement by Area

Where provided for in the Contract Documents, fog seal application will be paid for by the square yard. The total area shall be calculated to the minimum neat line dimension of the improvements as provided for in the Contract Documents or as approved by the Engineer. Measurements of square yardage of fog seal shall be measured to the nearest 0.1 square yard.

(F) Payment

Where provided to be paid as a separate pay item, the contract unit price per square yard for fog seal shall include full compensation for all labor, materials, equipment, and tools and for doing all work required in applying fog seal including but not limited to, preparation of the underlying surface, hauling, traffic control and applying fog seal complete in place as provided for in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

3-D.14 Seal Coat**(A) Description**

Where provided for in the Contract Documents, the Contractor shall construct a seal coat of asphaltic emulsion and screenings that covers the repaved trench section and the adjacent street pavement. The Engineer shall determine the limits of the seal coat application. Such seal coat shall be constructed in accordance with the provisions of Section 37-1, "Seal Coats" of the CALTRANS Standard Specifications for a coarse seal coat. A Certificate of Compliance shall be submitted for all materials used in constructing the coarse seal coat.

(B) Measurement

(1) Trench Repairs - Except as provided for in the Contract Documents, the costs associated with constructing a coarse seal coat as part of trench repair or reconstruction shall be considered as included in the contract unit or lump sum prices for other items of work and no additional compensation will be allowed therefor.

(2) Miscellaneous Areas - Except as provided for in the Contract Documents, the costs associated with constructing a coarse seal coat used in the construction of miscellaneous areas shall be considered as included in the contract unit or lump sum prices for the construction of such miscellaneous areas and no additional compensation will be allowed therefor.

(3) Measurement by Area - Where provided for in the Contract Documents; the construction of a coarse seal coat will be paid for by the square yard. The total area shall be calculated to the minimum neat line dimension of the improvements as provided for in the Contract Documents or as approved by the Engineer. Measurements of square yardage of double seal coat shall be measured to the nearest 0.1 square yard.

(4) Payment - Where provided to be paid as a separate pay item, the contract unit price per square yard for coarse seal coat shall include full compensation for all labor, materials, equipment, and tools and for doing all work required in constructing a coarse seal coat including but not limited to, preparation of the underlying surface, hauling, sweeping, and

traffic control necessary to construct the coarse seal coat complete in place as provided for in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

3-D.15 Concrete Structures

(A) Description

Minor concrete structures shall include but not be limited to, all precast concrete structures, cast-in-place concrete for thrust blocks, valve and hydrant pads, walks, curbs, and driveways, and pipe supporting structures.

Major concrete structures shall include but not be limited to retaining walls, sound/screen walls, floor slabs, pump buildings, pump pedestals, and other structures intended to support significant structural loads, vibrations, or where the failure of such structures could result in a significant risk to life, property, or equipment. Such structures shall be designed by a registered Civil or Structural Engineer licensed by the State of California.

The Contractor shall submit copies of mix designs, structural details, structural calculations and testing, Certificates of Compliance and other data and documents in accordance with the provisions of Section 6-D, "Submittals" of these Standard Specifications and the Contract Documents.

(B) Materials

(1) Portland Cement - Except as provided for elsewhere in the Contract Documents, Portland cement used in concrete structures shall be Type IP (MS) Modified or Type II Modified cement conforming with the requirements of ASTM C595, ASTM C150, and Section 90-2, "Materials" of the CALTRANS Standard Specifications.

(2) Aggregate - Except as provided for in the Contract Documents, aggregate shall conform with the provisions of Section 90-2, "Materials" of the CALTRANS Standard Specifications.

(3) Reinforcement - Except as provided for in the Contract Documents, all reinforcement shall conform with the requirements of Section 52, "Reinforcement" of the CALTRANS Standard Specifications.

(C) Classes of Concrete

All Portland cement concrete shall be one of the following classes, as provided for elsewhere in these Special Provisions and the Contract Documents:

Class "A": 564 pounds of cement per cubic yard (minimum)

Class "B": 470 pounds of cement per cub yard (minimum)

Generally, all major concrete structures shall be constructed of Class "A" concrete. All minor structures exposed to traffic loads including but not limited to, drainage inlets, manholes and bases, curb and gutter, and driveway approaches shall be constructed of Class "A" concrete.

Minor structures not exposed to traffic loads may be constructed of Class "B" concrete. Such minor structures shall include but are not limited to, pipe and valve supports, sidewalks, hydrant pads, sanitary seals, post bases, thrust blocks, and channel linings.

3-D.16 Minor Concrete Structures

(A) Precast Concrete Structures - Precast concrete structures shall include but not be limited to, valve boxes, meter boxes, vaults, drainage inlets, and manholes. Precast structures shall be manufactured by experienced manufacturers having a minimum of 5-years' experience in the manufacture of precast concrete structures of the type called for in the Contract Documents. Precast structures shall be as follows:

Meter BoxesOld Castle Concrete Products Model B-9

Valve BoxesOld Castle Concrete Products Model G5

Valve Vaults.....Old Castle Concrete Products "R" Series

ManholesHanson Concrete Products

Drainage InletsOld Castle Products V64 or U-Series

Lids and covers shall be as follows:

Meter Boxes	Non-Traffic: Old Castle Products Model B9D Traffic: Old Castle Products Model B9C
Valve Boxes	Old Castle Products Model G5C
Manhole Frame and Cover	Phoenix Iron Works Model P-1090
Drainage Inlets	Phoenix Iron Works Model P-63-01 or P-63-02 Old Castle Products RHD Series

All valve vaults larger than 2-feet square shall be equipped with torsion-assisted lids. All lids within the traveled way shall be designed for an AASHTO H20 traffic load. Each such lid shall be

equipped with a bolt down system or other approved security system to prevent unauthorized entry.

The citing of specific models herein is solely for the purpose of demonstrating the type, style, function, method of operation, and level of performance desired for precast concrete products by the District. The Contractor shall provide the appropriate model of structure provided for in the Contract Documents with regard to size, depth, traffic loads, opening size, lids and covers, and wall penetrations and other special provisions dictated by the service condition. All drainage inlets shall be supplied with welded and riveted reticulate type grates (Phoenix Iron Works Model P-63-01 or P-63-02, Christy V1-71C Cast Iron, or approved substitute.) All grates shall be designed for an AASHTO H20 traffic load except those in non-traffic areas. The dimensions of the grate shall be as provided for in the Contract Documents.

Insofar as practicable, all precast concrete structures shall be provided with precast openings for the installation of pipe through the wall. Where provided for in the Contract Documents, such wall openings shall be sized to permit sealing the annular space with a mechanical seal (Calpico Pipe Lynx, Thunderline Link-Seal, or approved substitute).

Where provided for in the Contract Documents, drainage inlets and manholes shall be provided with panels cast in the walls for removal to insert the drainage pipe.

3-D.17 Construction and Installation

(A) Description

The Contractor and the supplier shall provide all equipment, tools, materials, and labor, including but not limited to, trucks, transporters, drivers, operators, cranes, slings, hooks, and other facilities and tools as are necessary to transport plastic concrete or precast structures to the site of work and install it as called for in the Contract Documents. Such equipment, tools, materials, and labor shall be sufficient to move the structure to the point of installation and to install such structure safely and efficiently.

(B) Bedding and Backfill

Except for meter boxes or valve boxes, all precast structures shall be bedded on a minimum of 6-inches of clean sand or aggregate base rock compacted to 95-percent relative compaction. The excavation, including that for valve boxes, shall then be backfilled with a sand-cement slurry mix in accordance with [Section 3-D.01, "Bedding, Backfill, and Aggregate Bases"](#) of these Standard Specifications. In non-traffic areas such as under slabs, sand bedding may be substituted for the sand/cement slurry backfill with the prior approval of the Engineer.

(C) Cast-In-Place Bases

Where precast concrete structures are to be installed over cast-in-place bases, the excavation shall be made and a minimum of 6-inches of clean sand or aggregate base compacted to 95-percent shall be installed prior to pouring concrete. The base shall be cast to the dimensions and of the class of concrete called for in the Contract Documents. The base shall have a keyway cast to conform with the dimensions of the precast structure. The precast structure shall not be installed prior to the base achieving a curing level that will support the structure without deformation or damage. Indentation of the base surface will not be considered deformation. If the base visibly deforms or is otherwise damaged when loaded with the structure, the structure shall be removed and the base repaired or removed, at the Engineer's direction. Prior to placing the structure on the base, the Contractor shall install a self-sealing joint compound such as Ram-Nek to the interface. Each succeeding riser of the structure shall also be placed on such a sealing compound.

(D) Grouting

Where provided for in the Contract Documents, the Contractor shall grout the annular space between the pipe wall and the structure opening. Grout may also be required to provide a smooth finished surface. Such grout shall consist of equal amounts of Portland cement and mason's sand. White glue suitable for use as a concrete adhesive may be substituted for all or part of the water used in mixing the grout. Grout shall be of a stiff enough consistency to conform to the shape of the space or surface being grouted while still being workable. The surface being grouted shall be thoroughly cleaned of all deleterious material and wetted to the point where no water is readily absorbed but with no standing water on the surface. A thin layer of white glue may be applied to the surface immediately prior to commencing the grouting.

Grout shall be laid on smoothly with a steel trowel in thin lifts. Where the weight of the grout pulls the grout away from the structure wall, the grout shall be removed and a thinner lift applied. The final lift of grout shall conform to or provide a smooth transition to the surfaces being grouted. Grout shall extend to the full depth of annular spaces. Grout shall be kept moist for a minimum of 24-hours to facilitate proper curing. Quick curing cements may be used upon prior approval by the Engineer.

(E) Cast-In-Place Concrete Structures

Cast-in-place concrete structures shall include but not be limited to drainage inlets, valve vaults, curb or curb and gutter, sidewalk, channel linings, and other minor structures as provided for in the Contract Documents.

(F) Surface Finishes

All concrete structures shall receive the following surface finishes:

1. Buried surfacesOrdinary surface finish
2. Exposed vertical surfaces.....Class 1 surface finish
3. Sidewalks.....Fine broom finish
4. Face of curbsFine broom finish
5. Gutter linesSteel trowel finish
6. Channel liningsSteel trowel or fine broom finish
7. Manhole and inlet shelvesMedium broom finish
8. Floor SlabsFine broom finish

Finishes required above are hereby defined as follows:

- | | |
|--------------------------|---|
| Ordinary surface finish: | That finish resulting from direct contact with form materials without any additional treatment. |
| Class 1 surface finish: | That finish resulting from direct contact with form materials that has additionally been treated to remove blemishes including but not limited to, form marks, pockets, depressions, honeycombs bulges and other unsightly surface defects. Such additional treatment shall include but not be limited to, grinding, sacking, troweling, packing, and grout patching. The method of treatment shall be at the Contractor's discretion. The Engineer shall be the sole judge of the final condition of the finish. |
| Fine broom finish: | That finish resulting from lightly brooming the concrete surface with a fine horsehair broom perpendicular to the long axis of the surface. The surface shall first be floated and troweled to a smooth surface and edges and joints finished. When the concrete has taken its initial set and no additional paste worked to the surface, the surface shall be broomed. Care shall be taken to prevent filling any joints or breaking the radius of finished edges. All such defects shall be promptly retooled. All broom marks shall be continuous across the entire width of the surface. Deficiencies |

in the brooming shall be corrected by brooming the entire width of that area in one pass.

Medium broom finish: This finish shall be constructed in the same manner as that for a fine broom finish except that a stiffer broom shall be used. In no case shall the Contractor accomplish this finish by working an excess of paste to the surface to increase the relief of the finish surface.

Steel trowel finish: This finish shall be constructed in the same manner as that for the broom finishes except that the final surface shall be accomplished by use of a steel trowel of sufficient length to create a smooth surface across the full width of the concrete being finished. In no case shall the Contractor accomplish this finish by working an excess of paste to the surface to increase the polish of the finish surface.

3-D.18 Preparation and Forms

In preparing the area of work to receive cast-in-place concrete structures, the Contractor shall excavate the area to sound native material, removing all deleterious material found. The excavation shall be of sufficient depth to accommodate the structure plus the bedding or leveling course.

All existing concrete and asphalt surfaces to which the proposed concrete structure shall be joined or abutted shall be saw cut to a minimum of one-half the depth of the existing material. The existing surface shall be cleaned and wetted prior to placing new concrete. Where called for in the Contract Documents, dowels shall be inserted into existing concrete and grouted in place.

Where the Contract Documents provide for new concrete to bond to existing concrete, the existing concrete shall be prepared in accordance with the provisions for grouting in [3-D.17 "Construction and Installation", \(D\) Grouting](#) of these Standard Specifications. A thin coat of white glue or other approved bonding adhesive shall be applied to the existing surface immediately prior to placing new concrete.

Forms shall be constructed of either sound structural grades of lumber and plywood or steel, as required by the structure to be constructed. The forms shall be securely staked and braced to maintain the lines and grades called for in the Contract Documents when filled with plastic concrete. When major structures are provided for in the Contract Documents, all forms and false work shall be in accordance with such provisions. All forms shall be coated with a form

releasing agent before placing concrete. Care shall be taken to prevent release agent from coating any materials embedded in the concrete except as called for in the Contract Documents.

All reinforcing steel shall be securely tied in the configuration called for in the Contract Documents and placed to grade in the forms using epoxy coated chairs or other supports. If appropriate, the steel may be suspended from the top of the forms for such structures as light pole bases.

All anchor bolts, conduit, pipe, and ductwork shall be secured within the forms in the final configuration such that the placement of concrete does not disturb the position of such devices.

All forms and embedment including but not limited to, reinforcing steel, bedding and leveling courses, pipe, anchor bolts, and ductwork shall be inspected and approved by the Engineer prior to placing concrete. Failure to obtain this approval prior to placing concrete may be cause for rejection of the structure by the Engineer and all costs associated with such rejection, including but not limited to, removal and replacement or remedial work shall be borne by the Contractor and no additional compensation will be allowed therefor.

Immediately prior to placing concrete, all surfaces within the forms shall be thoroughly wetted. The bedding or base course shall be saturated up to the point that standing water appears.

3-D.19 Jointing and Tooling

The Contractor shall construct expansion joints between adjacent concrete structures as called for in the Contract Documents or as required by agencies having jurisdiction over the work.

Expansion joints shall be constructed using 2-inch preformed, impregnated fiber filler material conforming with the provisions of ASTM D1751. The filler shall extend the full depth of the concrete and in one continuous piece across the full width of the structure.

Contraction joints shall be constructed by driving a steel trowel or similar tool to at least half the depth of the concrete in curbs and sidewalks.

On larger cast-in-place slabs, the contraction joints shall be constructed in accordance with the provisions of Section 40-1.08B, Weakened Plane Joints of the CALTRANS Standard Specifications. Alternatively, weakened plane joints may be created by the Soff-Cut method wherein the contraction joint is sawn within 4-hours of finishing the concrete.

All joints shall be finished by use of a grooving tool or radius trowel with a 2-inch radius.

(A) Placement

All concrete shall be placed in a continuous operation to the limits that can be properly finished in the normal workday. As required by the structure being constructed, the Contractor shall use such methods and devices as are necessary to prevent segregation of aggregates within the mix. Such methods and devices shall include but not be limited to, pumping, chutes, and buggies.

Concrete shall be placed from the lowest point in the forms to the highest and struck off flush to the top of the forms preparatory to finishing. As required by the structure being constructed, concrete shall be tamped, rodded, or vibrated within the forms to ensure full face contact with the forms and all embedments with no pockets of aggregate being formed. Care shall be taken to prevent any displacement of the forms and embedments while agitating the plastic concrete. Concrete vibrators shall not be permitted to contact reinforcing steel or other embedments.

Where work will recommence at a later date, the interface shall be defined by a form as provided for herein. Dowels shall be installed where provided for in the Contract Documents. No concrete shall be placed until sufficient trained personnel are available to place and finish the concrete properly. Failure to provide sufficient personnel to accomplish the work shall be cause to delay the placement and the Contractor shall bear all costs associated with such delay.

Concrete shall be delivered with a sufficient water/cement ratio to permit a slump of 2-inches to 4-inches at the design strength specified in the Contract Documents. The addition of water to cool the mix or otherwise influence the curing rate shall be cause for rejection of all such altered concrete.

Concrete shall be freshly mixed and placed prior to the commencement of the curing reaction. Concrete that has experienced in excess of 250 revolutions in a transit mix truck, has not been discharged within 1-2 hours of batching out, or that has attained a temperature in excess of 90 degrees Fahrenheit shall be rejected. The load ticket accompanying the load shall show the date and time of batching out, initial revolution counter reading, and the project name. Any concrete placed exceeding these conditions shall be removed and disposed of in accordance with Section 3-708, Disposal of Material Outside the Highway Right-of-Way of the CALTRANS Standard Specifications. The Contractor shall bear all costs associated with the rejection of such defective concrete including but not limited to, standby time, disposal of defective concrete not yet incorporated in the work, removal of such defective concrete from the site of work, and replacement of such defective concrete.

The Contractor shall cure the concrete by use of a curing compound conforming with the provisions of ASTM C309. The selection of the compound shall be the Contractors. Alternatively, the Contractor may choose to use a wet curing method wherein the surface of

the concrete is kept continuously wet for a minimum period of 72-hours. This may be accomplished by the use of sand blankets, burlap sacking, carpeting, and polyethylene sheeting at the Contractor's discretion and subject to the Engineer's prior approval.

The Contractor shall protect the finish of the concrete from all damage during curing including but not limited to vandalism, shrinkage cracks due to improper curing, footprints and wheel tracks, and marks from the wet curing method, if used. All vehicular traffic shall be kept off the fresh concrete for a minimum period of 7-days and vehicles in excess of 3-tons GVW for a period of 28-days. The Contractor shall not commence structural work that will load the concrete for a minimum period of 7-days or until the concrete has attained 2/3 of the 28-day compressive strength, whichever is earliest.

(B) Precast Sound/Screening Wall

Precast sound/screen walls shall consist of cast-in-drilled hole piers, structural steel columns, reinforced concrete pilasters, and precast, reinforced concrete panels. Precast sound/screening walls shall be as manufactured by Sierra Precast, Inc. or approved substitute. Concrete for precast sound/screening walls shall be Class "A" in accordance with [3-B.05 "Thrust Restraint", \(C\) Portland Cement Concrete Thrust Blocks](#) of these Standard Specifications. The exterior finish shall be ship lap or as provided for in the Contract Documents. The interior shall be fine broom finished or approved substitute.

3-D.20 Placement

(A) Description

Cast -in-place floor slabs shall be constructed to the dimensions and of the materials provided for in the Contract Documents. All subsurface construction shall be completed and the work approved by the Engineer prior to commencing the concrete pour. Approval of the Engineer shall only be for the completeness of the work and its general conformance with the intent of the Contract Documents. The Contractor shall retain full responsibility for the condition and performance of such substructures until the completion of the project in accordance with the provisions of the Contract Documents. All concrete shall be Class "A" in accordance with [3-B.05 "Thrust Restraint", \(C\) Portland Cement Concrete Thrust Blocks](#) of these Standard Specifications.

(B) Construction

Where a precast sound/screening wall is provided for in the Contract Documents, the precast sound/screening wall shall be erected prior to casting the floor slab. The wall shall be set to provide a 4-inch overlap between the top of the slab and the bottom of the wall.

The excavation shall be carried to a depth to permit the placement of a minimum of 4-inches of 3/4-inch to 1 ½ inch drain rock against the native subgrade which has been excavated to sound competent material. Over the drain rock, a 10-mil polyethylene sheet shall be placed to act as a vapor barrier. The sheeting shall extend to at least the bottom of the sound/screening wall where provided for in the Contract Documents.

A 2-inch leveling course of sand shall then be placed over the sheeting.

Where a precast sound/screening wall is provided for in the Contract Documents, immediately prior to placing the plastic concrete, the Contractor shall place a water seal of Volclay tape against the interface of the precast wall and the floor slab. The floor slab shall be cast to the lines and grades provided for in the Contract Documents. The surface shall be graded to drain as provided for in the Contract Documents. The finish shall be a fine broom finish.

3-D.21 Chain Link Fencing

(A) Description

Where provided for in the Contract Documents, the Contractor shall construct a chain-link fence at the locations and of the dimensions provided for. Such fencing shall be in accordance with these specifications, and in general conformance with Section 80, Fences of the CALTRANS Standard Specifications.

(B) Materials

(1) Posts and Rails - All posts and rails shall be fabricated from Schedule 40 galvanized iron pipe conforming with the provisions of [Section 3-B03, "Service Pipe Materials"](#) of these Standard Specifications. Each gate post and each line post not having a barbed wire support shall be equipped with a standard fence post cap.

(2) Fabric - Chain link fence fabric shall be steel wire helically wound and interwoven in such a manner as to result in a continuous mesh with no knots or ties except in forming the selvage of the fabric. The base material of the wire shall be galvanized No. 9 AWG. Where provided for in the Contract Documents, the fabric shall be furnished with redwood slats interwoven in the fabric in a vertical direction.

(3) Gate Hinges and Latches - Each gate shall be equipped with a minimum of 2 heavy-duty pintle type hinges. One leaf of the gate shall be equipped with a gate fork type of latch manufactured of heavy-duty galvanized malleable iron and equipped with a padlock hole. The inactive leaf shall be equipped with a heavy-duty cane-type assembly that seats in a galvanized steel pipe set minimum 12-inches in the underlying material. This pipe shall be surrounded by a collar of Class B Portland cement concrete at least 6-inches thick and 12 -inches in diameter.

(4) Barbed Wire - Barbed wire atop fences shall be a minimum of No. 14 AWG galvanized. Barbed wire supports shall be so designed as to be securely fastened to the post top and support the wire in position and angle provided for in the standard plan and the Contract Documents. The supports shall be capable of withstanding a 250-pound load applied at the end without deflection.

(C) Construction

(1) General - All chain link fencing shall be constructed within 6-inches and on the District side of all property lines except as provided for in the Contract Documents. Except as provided for in the Contract Documents, fences shall provide a minimum of 18-inches clearance to all structures.

(2) Fence Posts - Fence posts shall be set in neatly drilled holes and backfilled with Class B Portland cement concrete. Holes shall be a minimum of 6-inches greater diameter than the post. Fence posts set in retaining walls shall be constructed by the use of a 4-inch diameter PVC pipe sleeve in the wall. The annular space between the post and the pipe wall shall be filled with a Cementous grout. Concrete and grout shall be struck off such that there is a minimum of 1/4-inch fall across the finish surface. No construction of fence elements shall commence until the concrete or grout has been allowed to cure a minimum of 3-days.

(3) Truss Rods and Brace Rails - At each corner post, a 3/8-inch diameter truss rod with tightener shall be installed between the corner post and the first line post in each direction. A 1½ inch OD, brace rail shall be installed across each intersection panel. Crossed truss rods shall be installed across the two panels on either side of the gates and across the gate panels. A 1½ inch O.D. brace rail shall be installed across each adjacent panel. The bottom rail shall be located 2-inches above the final grade of the site at the line of the fence.

(4) Gates - Gates shall be constructed of the same materials used in the overall fence. Corners and brace rails shall be assembled using manufactured fittings or by shop welding. Any welding shall be galvanized after fabrication by either the hot-dip process or the hot-stick application of metallic zinc. Manway gates shall not be required to have truss rods. The latch shall be secured to the gate frame by either tack welding or pinning such that it cannot be dislodged from the original position.

(5) Fabric - Fabric shall be secured to the top and bottom rails and any brace rails at 24-inch intervals using No. 9 AWG galvanized tie wire. Fabric shall also be secured to all posts with No. 9 AWG tie wire at 24-inch intervals. At each corner or gate, the fabric shall be secured to the posts using a 1/4-inch by 3/4-inch galvanized steel tension bar. The tension bar shall be secured to the post by the use of 1-inch by 11 gauge galvanized steel strap at 12-inches on

center vertically. All fabric shall be installed on the outside of all posts and rails with respect to the District property.

Fabric shall be stretched taut using any tensioning device or method that will accomplish the tensioning without distorting the fabric. The Contractor shall be responsible for the method selected.

(6) Measurement and Payment - The contract unit price per linear foot for 6-foot Chain Link Fence shall include full compensation for all labor, materials, equipment, and tools and for doing all work required in constructing a chain link fence including but not limited to, clearing and leveling of the underlying surface, installing fence posts, fabric, gates, and hardware necessary to construct the chain link fence complete in place as provided for in the Contract Documents, as provided for in these Standard Specifications, and as directed by the Engineer and no additional compensation will be allowed therefor.

END OF DOCUMENT

SECTION 4 AWARD DOCUMENTS

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4-A NOTICE OF INTENT TO AWARD

DATED:

TO: ***Contractor***

ADDRESS:

CONTRACT WITH: Scotts Valley Water District

PROJECT NAME: Grace Way Well – Site Improvements

The Contract Sum of your contract is sum in words Dollars (\$_____).

You must comply with the following conditions precedent by 5.00 p.m. of the 10th Day following the date of this Notice of Award.

Deliver to Owner one (1) fully executed counterpart of the Contract (4-B) executed by you.

Deliver to Owner one (1) original of the Performance Bond (4-C), executed by you and your surety.

Deliver to Owner one (1) original of the Labor and Material Payment Bond (4-D), executed by you and your surety.

Deliver to Owner one (1) original set of the insurance certificates with endorsements required under the Supplementary Conditions - Insurance.

Deliver to Owner one (1) original of the Guaranty, executed by you.

Failure to comply with these conditions within the time specified will entitle Owner to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.

After you comply with the conditions in this Notice of Award, Owner will return to you one fully signed counterpart of the Agreement.

Before you may start any work at the site, you must attend a preconstruction conference. The preconstruction conference may be arranged through Scotts Valley Water District staff.

Questions regarding bonds and insurance may be directed to Piret Harmon, General Manager of Scotts Valley Water District. All other inquiries regarding the Project should be directed to Nate Gillispie – Operations Manager with Scotts Valley Water District.

Upon commencement of the Work, you and each of your Subcontractors shall certify and provide Owner copies of payroll records on forms provided by the Division of Labor Standards Enforcement, in accordance with California Labor Code §1776.

OWNER

Scotts Valley Water District

By:

David McNair, General Manager

END OF DOCUMENT

4-B AGREEMENT

This agreement, dated this [date] day of [Month], 2024, by and between [Name of Contractor] whose place of business is located at [Address of Contractor] ("Contractor"), and the Scotts Valley Water District ("Owner"), acting under and by virtue of the authority vested in Owner by the laws of the State of California.

WHEREAS, Owner, on the [date] day of [Month, Year] awarded to Contractor the following Contract:

Grace Way Well - Site Improvements

at

GRACE WAY WELL SITE

5297-5299 SCOTTS VALLEY DRIVE

SCOTTS VALLEY, CA 95066

Now, therefore, in consideration of the mutual covenants hereinafter set forth, Contractor and Owner agree as follows:

SCOPE OF WORK OF THE CONTRACTWork of the Contract

Contractor shall complete all Work specified in the Contract Documents, in accordance with the Specifications, Drawings, and all other terms and conditions of the Contract Documents for the Grace Way Well - Site Improvements.

Price for Completion of the Work

Owner shall pay Contractor the following Contract Sum (Contract Sum) for completion of Work in accordance with Contract Documents as set forth in Contractor's Bid, attached hereto.

The Contract Sum includes all allowances (if any).

COMMENCEMENT AND COMPLETION OF WORK

Contractor shall commence Work on the date established in the Notice to Proceed (*Commencement Date*).

Owner reserves the right to modify or alter the Commencement Date.

COMPLETION OF WORK

Contractor shall achieve Substantial Completion of the entire Work within 70 Days from the Commencement Date.

Contractor shall achieve Final Completion of the entire Work 120 Days from the Commencement Date.

PROJECT REPRESENTATIVES

Owner's Project Manager

Owner has designated C2G/Civil Consultants Group, Inc. to act as Owner's Representative in all matters relating to the Contract Documents related to the well site improvements.

Project Manager shall have final authority over all matters pertaining to the Contract Documents and shall have sole authority to modify the Contract Documents on behalf of Owner, to accept work, and to make decisions or actions binding on Owner, and shall have sole signature authority on behalf of Owner.

Owner may assign all or part of the Project Manager's rights, responsibilities, and duties to a Construction Manager, or other Owner Representative.

Contractor's Project Manager

Contractor has designated [_____ or other] as its Project Manager to act as Contractor's Representative in all matters relating to the Contract Documents.

Architect/Engineer

C2G/Civil Consultants Group, Inc. furnished the Specifications and shall have the rights assigned to Architect/Engineer in the Contract Documents related to the well site improvements.

Architect/Engineer has designated Todd Creamer as its project manager, to act as its representative for receiving and making communications authorized under the Contract Documents for the well site improvements.

LIQUIDATED DAMAGES FOR DELAY IN COMPLETION OF WORK

As liquidated damages for delay Contractor shall pay Owner _____ dollars (\$560.00) for each Day that expires after the time specified herein for Contractor to achieve Substantial Completion of the entire Work, until achieved.

Measures of liquidated damages shall apply cumulatively.

Limitations and stipulations regarding liquidated damages are set forth in Document 2-F.

Contract Documents

Contract Documents consist of the following documents, including all changes, Addenda, and Modifications thereto:

SECTION 1 BID DOCUMENTS

- 1-A Notice Inviting Bids
- 1-B Instruction to Bidders
- 1-C Bid Form
- 1-D Bid Bond
- 1-E Subcontractors List
- 1-F Non-Collusion Affidavit
- 1-G Statement of Qualifications
- 1-H Bidder Certifications
- 1-I Iran Contracting Art Certification

SECTION 2 PROJECT SPECIFIC PLANS AND SPECIFICATIONS

- 2-A Description of Work
- 2-B Reports and Information on Existing Conditions
- 2-C CEQA Conditions and Mitigation Measures
- 2-D Project Specific Specifications
- 2-E Addenda
- 2-F Special Conditions and Liquidated Damages

SECTION 3 DISTRICT STAND SPECIFICATIONS

- 3-A General Technical Requirements
- 3-B Potable Water System
- ~~3-C Recycled Water System~~
- 3-D Site Work

SECTION 4 AWARD DOCUMENTS

- 4-A Notice of Intent to Award
- 4-B Agreement
- 4-C Performance Bond
- 4-D Payment Bond
- 4-E Maintenance Bond
- 4-F Contractor's Insurance Certificates and Endorsements

4-G Warranty and Guaranty
4-H Contractor's W-9 Form
4-I Notice to Proceed

SECTION 5 GENERAL CONDITIONS

5-A General Conditions
5-B Prevailing Wages & Labor Compliance
5-C Insurance and Indemnification

SECTION 6 CONTRACT ADMINISTRATION

6-A Pre-Award Substitution
6-B Information and Procedures Instructions
6-C Modification Procedures
6-D Submittals
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SECTION 7 PROJECT FORMS

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There are no Contract Documents other than those listed above. The Contract Documents may only be amended, modified or supplemented as provided in the Contract Documents.

MISCELLANEOUS

It is understood and agreed that in no instance are the persons signing this Agreement for or on behalf of Owner or acting as an employee, agent, or representative of Owner, liable on this Agreement or any of the Contract Documents, or upon any warranty of authority, or otherwise, and it is further understood and agreed that liability of Owner is limited and confined to such liability as authorized or imposed by the Contract Documents or applicable law.

Pursuant to Labor Code Section 1771.1(a), Contractor represents that it and all of its Subcontractors are currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. Contractor covenants that any additional or substitute Subcontractors will be similarly registered and qualified.

In entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, Contractor or Subcontractor offers and agrees to assign to the awarding body all rights, title, and interest in and to all causes of action it may have under

Section 4 of the Clayton Act (15 U.S.C. §15) or under the Cartwright Act (Chapter 2 (commencing with 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time Owner tenders final payment to Contractor, without further acknowledgment by the parties.

Notice of prevailing wage requirements. Notice is hereby given that pursuant to labor code 1771, prevailing wages are required to be paid for any work which is a “public work” as defined in labor code section 1720(a). The work of this contract is a public work.

Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the Contract, as determined by Director of the State of California Department of Industrial Relations, are deemed included in the Contract Documents and on file at Owner’s Office, and shall be made available to any interested party on request. Pursuant to California Labor Code 1860 and 1861, in accordance with the provisions of Section 3700 of the Labor Code, every contractor will be required to secure the payment of compensation to his employees. Contractor represents that it is aware of the provisions of Section 3700 of the Labor Code which require every employer to be insured against liability for workers’ compensation or to undertake self-insurance in accordance with the provisions of that Code, and Contractor shall comply with such provisions before commencing the performance of the Work of the Contract Documents.

This Agreement and the Contract Documents shall be deemed to have been entered into in the County of Santa Cruz, State of California, and governed in all respects by California law (excluding choice of law rules). The exclusive venue for all disputes or litigation hereunder shall be in the Superior Court for the County of Santa Cruz, State of California.

IN WITNESS WHEREOF the parties have executed this Agreement in quadruplicate the day and year first above written.

CONTRACTOR: [CONTRACTOR'S NAME]

By: _____ (Signature)

(Print Name)

(Title)

By: _____ (Signature)

(Print Name)

(Title)

OWNER: [NAME OF OWNER]

By: _____ (Signature)

(Print Name)

(Title)

END OF DOCUMENT

4-C PERFORMANCE BOND

Whereas, the Scotts Valley Water District ("District") and _____ ("Contractor")
have entered into a Construction Contract dated _____ Date _____
whereby Contractor has agreed to construct certain improvements for the project known as
Grace Way Well - Site Improvements _____ ; and

WHEREAS, Contractor desires to construct, install and complete the Work as described in the
Contract; and

WHEREAS, Contractor is required under the terms of the Contract to furnish and maintain a
bond for the faithful performance of the Work described in the Contract.

NOW THEREFORE, we, Contractor and _____
a California admitted surety ("Surety"), are held and firmly bound unto the District, and
for the benefit of any and all persons who may suffer damages by breach of the conditions
hereof, in the penal sum of _____ dollars,
\$ _____ (100% of the Contract Amount) lawful money of the United States,
for the payment of which sum well and truly to be made, we bind ourselves, our heirs,
successors, executors and administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the 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 terms, covenants, conditions, and provisions of the Contract, which is
incorporated herein 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, as to installation and
completion of said public improvements and in all respects according to their true intent and
meaning, and shall indemnify and save harmless District, its officers, agents and employees, as
therein stipulated, then this obligation shall become null and void; otherwise, it shall be and
remain in full force and effect.

As part of the obligation secured hereby and in addition to the face amount specified therefor,
there shall be included costs and reasonable expenses and fees, including reasonable attorneys'
fees, incurred by District in successfully enforcing such obligations, all to be taxed as costs and
included in any judgment rendered.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or
addition to the terms of the Contract or to the work to be performed thereunder or the

specifications accompanying the same shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, the Contractor and Surety have duly executed this instrument on the date and year set forth below.

CONTRACTOR

SURETY

Signed: _____

Signed: _____

Name: _____

Name: _____

Title: _____

Title: _____

Note: Surety signature must be notarized

END OF DOCUMENT

4-D PAYMENT BOND

WHEREAS, the Scotts Valley Water District ("District") and _____ ("Contractor")
have entered into a Construction Contract dated, _____ ("Contract")
whereby Contractor has agreed to construct certain improvements for the project known as
(Project Name) _____ ; and

WHEREAS, Contractor desires to construct, install and complete the Work as described in the Contract; and

WHEREAS, under the terms of said Contract, Contractor is required, before entering upon the performance of the work, to file a good and sufficient payment bond with the District to secure the claims to which reference is made in Civil Code Section 9550 et seq.

NOW THEREFORE, we, Contractor and _____
a California admitted surety ("Surety"), are held and firmly bound unto the District, and all
contractors, subcontractors, laborers, material, men and other persons employed in the
performance of the aforesaid Contract and referred to in the aforesaid Civil Code in the sum of

WRITE OUT DOLLAR AMOUNT dollars, \$ _____

(100% of the Contract Sum), lawful money of the United States, for materials furnished or labor
thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to
such work or labor, that said Surety will pay the same in an amount not exceeding the amount
hereinabove set forth, and also in case suit is brought upon this bond, will pay, in addition to the
face amount thereof, costs and reasonable expenses and fees, including reasonable attorneys'
fees, incurred by the District in successfully enforcing such obligation, to be awarded and fixed
by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under Civil Code Section 9550 et seq, so as to give a right of action to them or their assigns in any suit brought upon this bond. Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise, it shall be and remain in full force and effect.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the specifications.

IN WITNESS WHEREOF, the Contractor and Surety have duly executed this instrument on the date and year set forth below.

CONTRACTOR

SURETY

Signed: _____

Signed:

Name: _____

Name:

Title: _____

Title:

Note: Surety signature must be notarized

END OF DOCUMENT

4-E MAINTENANCE BOND

WHEREAS, the Scotts Valley Water District ("District") and _____ ("Contractor")
have entered into a Construction Contract dated, _____ ("Contract")
whereby Contractor has agreed to construct certain improvements for the project known as

Grace Way Well - Site Improvements _____ ; and

WHEREAS, the Contractor is required under the terms of the Contract to furnish a Maintenance Bond for the correction of any defects due to defective materials or workmanship in the work performed under the Contract.

NOW THEREFORE, we, Contractor and _____
a California admitted surety ("Surety"), are held and firmly bound unto the District, and for the benefit of any and all persons who may suffer damages by breach of the conditions hereof, in the penal sum of _____ WRITE OUT DOLLAR AMOUNT _____ dollars, \$ _____
lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

The conditions of this obligation are such that if, during the maintenance period of two (2) years from the date of acceptance by the District of the work required to be performed under the Contract, the Contractor, upon receiving written notice of a need for repairs which are directly attributable to defective materials or workmanship, shall diligently take the necessary steps to correct said defects within ten (10) days from the date of said notice, then this obligation shall be null and void; otherwise it shall remain in full force and effect.

If any action shall be brought by the District upon this bond, a reasonable attorneys' fee, to be fixed by the Court, shall be and become a part of the District's judgment in any such action.

IN WITNESS WHEREOF, the Contractor and Surety have duly executed this instrument on the date and year set forth below.

CONTRACTOR

SURETY

Signed: _____

Signed:

Name: _____

Name:

Title: _____

Title:

Note: Surety signature must be notarized

END OF DOCUMENT

4-F CONTRACTOR'S INSURANCE CERTIFICATES AND ENDORSEMENTS

[Contractor to Provide]

Insurance Certificates and Endorsements shall comply with the requirements in
Section 5 Insurance and Indemnification

END OF DOCUMENT

4-G WARRANTY AND GUARANTY

TO: The Scotts Valley Water District ("Owner"), in connection with the construction of the:
Grace Way Well - Site Improvements

project located at: Grace Way Well Site – 5297-5299 Scotts Valley Drive California ("Project"), the undersigned Contractor guarantees all construction performed on this Project and also guarantees all labor, materials, equipment incorporated therein.

Contractor hereby grants to Owner for a period of two (2) years following the date of Final Acceptance of the Work completed, or such longer period specified in the Contract Documents, its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work.

Neither final payment nor use nor occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with this Guaranty or relieve Contractor of liability in respect to any express warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting therefrom, which shall appear within two (2) years, or longer if specified, from the date of Final Acceptance of the Work completed.

If within two (2) years after the date of Final Acceptance of the Work completed, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be Defective, Contractor shall promptly, without cost to Owner and in accordance with Owner's written instructions, correct such Defective Work. Contractor shall remove any Defective Work rejected by Owner and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, Owner may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses, and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, Owner shall have all rights and remedies granted by law.

Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though equipment, materials, or Work required to be provided under the

Contract Documents have been inspected, accepted, and estimated for payment, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be Defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the guaranty period.

The foregoing Guaranty is in addition to any other warranties of Contractor contained in the Contract Documents, and not in lieu of, any and all other liability imposed on Contractor under the Contract Documents and at law with respect to Contractor's duties, obligations, and performance under the Contract Documents. In the event of any conflict or inconsistency between the terms of this Guaranty and any warranty or obligation of the Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of the Contractor.

Dated: _____

Contractor: _____

Signature: _____

Print Name: _____

Title: _____

Street Address: _____

END OF DOCUMENT

4-H CONTRACTOR'S W-9 FORM

END OF DOCUMENT

4-I NOTICE TO PROCEED

Date: _____, 2024
To: _____ (Contractor)
Address: _____

CONTRACT FOR: SCOTTS VALLEY WATER DISTRICT

You are notified that the Contract Time under the above Contract will commence to run on performing your obligations with respect to Work at the project site described in the Contract Documents. In accordance with the Agreement, the dates of Substantial Completion and Final Completion for the entire Work are: Grace Way Well - Site Improvements, 2024 respectfully.

Before you may start any Work at the Site, you must:

1. Submit certified Safety Program and related Submit copies of applicable permits

OWNER

By: _____
Its: _____

END OF DOCUMENT

SECTION 5 GENERAL CONDITIONS

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5-A GENERAL CONDITIONS**NOTICE TO PROCEED**

The Contractor shall not commence Work on the Project until the Owner issues a Notice to Proceed with the Work. The Contractor shall complete the Work within the time set forth in the Construction Contract, time being of the essence, subject to the delay provisions set forth in this Contract.

CONTRACT ADMINISTRATION

The Owner Representative will provide administration of the Contract as hereinafter described. Hereinafter, the term Owner Representative is the General Manager of the Owner and any and all representatives working under the direction of the Owner Representative.

The Owner Representative has the authority to act on behalf of the Owner on change orders, field orders, progress payments, Contract decisions, the acceptability of the Contractor's work, or early possession.

The Owner Representative has the authority to accept or reject requests for progress payments which have been submitted by the Contractor and recommended by the Owner Representative.

The Owner Representative has the authority to make the final determination of the acceptability of the Work. The Owner's Representative also has the authority to accept or reject recommendations regarding correction of defective work.

The Owner Representative will observe the progress, quality, and quantity of the Work to determine, in general, if the Work is proceeding in accordance with the provisions of the Contract Documents. The Owner Representative shall not be responsible for construction means, methods, appliances techniques, sequences, or procedures, or for safety precautions and programs in connection with the work.

In accordance with the provisions detailed elsewhere in these General Conditions, the Owner's Representative will make decisions relative to all matters of interpretation or execution of the Contract Documents.

CONSTRUCTION SCHEDULE

The Owner Representative has the authority to review and recommend acceptance of the progress schedule submitted by the Contractor at the start of the Work and subsequent significant revisions for conformance to the specified sequence of work and logic.

The Owner Representative, with the assistance of the Design Consultant, will conduct inspections to determine the dates of substantial completion of the Work and final completion of the Work, and will receive and forward to the Owner, for the Owner's review, written warranties, and related documents required by the Contract and assembled by the Contractor.

OWNER'S RIGHT TO USE OR OCCUPY

The Owner reserves the right, prior to Substantial Completion, to occupy, or use, any completed part or parts of the Work, providing these areas have been approved for occupancy by the Owner. Subject to applicable laws, the exercise of this right shall in no way constitute an acceptance of such parts, or any part of the Work, nor shall it in anyway affect the dates and times when progress payments shall become due from the Owner to the Contractor or in any way prejudice the Owner's rights in the Contract, or any bonds guaranteeing the same. The Contract shall be deemed completed only when all the Work contracted has been duly and properly performed and accepted by the Owner.

Prior to such occupancy or use, the Owner and Contractor shall agree in writing regarding the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents.

In exercising the right to occupy or use completed parts of the Work prior to the Substantial Completion thereof, the Owner shall not make any use which will materially increase the cost to the Contractor, without increasing the Contract Amount, nor materially delay the completion of the Contract, without extending the time for completion.

OWNER'S RIGHT TO CARRY OUT THE WORK

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of the Contract, and fails within five (5) days after receipt of written notice from the Owner to commence and continue correction of such neglect or deficiency with diligence and promptness, the Owner may, and without prejudice to any other remedy, make good such default, neglect or failure.

The Owner also reserves the right to perform any portion of the work due to an emergency threatening the safety of the Work, public, Owner, and any property or equipment.

In either case, a Change Order shall be issued unilaterally deducting from the payments then or thereafter due the Contractor the cost of correcting such deficiencies and/or for performing such work, including compensation for the Design Consultant's, the Owner Representative's,

and Owner's additional services made necessary by such default, neglect, failure or emergency.

OWNER'S RIGHT TO PERFORM WORK AND TO AWARD SEPARATE CONTRACTS

The Owner reserves the right to perform work related to the Project with the Owner's own forces and to award separate contracts in connection with the Project or other work on the Project site. If the Contractor claims that delay, damage, or additional cost is involved because of such action by the Owner, the Contractor shall make such claim as provided elsewhere in the Contract Documents.

When separate contracts are awarded for different portions of the Project or other work on the Project site, the term "Contractor" in the Contract Documents in each case shall mean the contractor who executes each separate Contract.

RESPONSIBILITY OF THE OWNER

The Owner shall not be held responsible for the care or protection of any material or parts of the work under this Contract prior to final acceptance.

STATUS OF CONTRACTOR AND SUBCONTRACTORS

It is stipulated and agreed that the Contractor shall be an independent contractor in the performance of this Contract and shall have complete charge of persons engaged in the performance of the Work. The Contractor shall perform the Work in accordance with its own means, methods, and appliances subject to compliance with the requirements of the Contract.

Subcontractors will not have or be recognized as having a direct relationship with the Owner. The persons engaged in the work, including employees of subcontractors and suppliers, will be considered employees of the Contractor and their work shall be subject to the provisions of the Contract. References in the Contract Documents to actions required of subcontractors, manufacturers, suppliers, or any person other than the Contractor, the Owner or the Owner Representative shall be interpreted as requiring that the Contractor shall require such subcontractor, manufacturer, supplier or person to perform the specified action.

The Contractor shall not employ any subcontractors that are not properly licensed in accordance with State law. Prior to commencement of any work by a subcontractor, the Contractor shall submit verification to the Owner Representative that the subcontractor is properly licensed for the work it will perform.

Contractor shall be fully responsible to Owner for the performance, acts, and omissions of its subcontractors, and of persons directly or indirectly employed by them. Each subcontract shall

expressly incorporate by reference the terms of this Contract, including the following provisions:

Each subcontractor shall carry insurance as required by the Contract Documents, and provide evidence of such insurance, as provided herein.

Each subcontractor shall be obligated to defend, indemnify, and hold the Owner harmless from all claims arising from the subcontractor's portion of the Work in the same manner as Contractor.

Each subcontract shall acknowledge the Owner's right to suspend or terminate the Contract and waive any right to anticipate profits in the event of such termination.

USE AND PROTECTION OF OWNER'S SITE AND ADJACENT PROPERTY

Subject to the approval of the Owner, the Contractor may use portions of the Owner's site for storage of construction equipment, materials and field offices. The Owner will not accept any responsibility for damage to or loss of the Contractor's equipment or materials stored on any Project related site caused by vandalism, nature, or otherwise, suffered by the Contractor. Protection of all construction equipment, stores, and supplies shall be the sole responsibility of the Contractor. Where additional workspace is desired by the Contractor or where the Owner cannot provide the space to the Contractor, it shall be the Contractor's sole responsibility and expense to obtain such a space for its use.

All workers or representatives of the Contractor, subcontractors or suppliers are admitted to the Site only for the proper execution of the Work in accordance with the Contract Documents. Furthermore, no persons may occupy property owned by the Owner outside the limit of the Work without the express written permission of the Owner Representative.

The Contractor shall enforce any instructions from the Owner Representative regarding combustible materials, placement of signs, danger signals, barricades, radios, noise, dust, and smoking. Upon completion of the Work, the Contractor shall remove all temporary barricades, signs and related materials.

The Contractor shall determine safe loading capacities and shall not overload any structure, building, pipe or other existing facility beyond its safe capacity during construction. In addition to any requirements imposed by law, the Contractor shall shore up, brace, underpin and protect as may be necessary all foundations and other parts of all existing structures, facilities and improvements on the Site or adjacent to the Site which are in any way affected by the Contractor's excavations or other operations connected with the Work. Prior to commencing

any work which in any way affects adjoining or adjacent land or buildings thereon, or public utilities, the Contractor shall notify the Owner Representative to discuss responsibilities for properly notifying the owners/occupants of adjacent land and the protective measures taken by the Contractor. Upon request of the Owner Representative, the Contractor shall meet with the recipient of any notice or attend local public meetings as proper public outreach on local impacts caused by the completion of the Work.

The Contractor shall take all necessary precautions to protect existing facilities against the effects of all weather and environmental elements and Contractor shall be strictly liable for failure to protect any facility.

All existing improvements and facilities shall be protected from any damage resulting from the operations, equipment or workers of the Contractor.

The Contractor shall take all steps necessary to protect all structures, buildings, land and other facilities from fires and sparks originating from the Work. The Contractor shall comply with all laws and regulations regarding fire protection and shall comply with all instructions given by the fire department with jurisdiction.

Any damage to existing conditions, or to any other improvement or property above or below the ground surface, whether public or private, arising from the Contractor's operations or performance of the Work shall be repaired within forty-eight (48) hours by the Contractor without expense to the Owner, unless disruption of the Owner's operations or creation of a safety hazard has occurred, in which case damage will be repaired immediately. The forty-eight (48) hour non-emergency repair response time may be extended only if agreed to in writing by the Owner and/or private property owner. Any delays to the project completion times caused by such repairs shall be considered non-compensable and no further extension of the Contract Time will be granted therefor. Should the Contractor fail to timely repair damage caused by its operations or performance in accordance with this section, the Owner may take steps to protect property and life, in its sole discretion, and deduct the entire cost of such work from amounts due or that may become due to the Contractor. No prior notice to the Contractor shall be necessary for the Owner to take such action.

COMPLIANCE WITH LAWS

Public Works Contract

The Owner is a public agency and is subject to the provisions of law relating to public contracts. It is agreed that all provisions of law applicable to public contracts are a part of these Contract Documents to the same extent as though set forth herein.

Compliance with Laws

The Contractor, shall at its own cost and expense, observe and keep itself and its subcontractors fully informed of all existing and future legislated State and Federal Laws and City and County ordinances and regulations which in any manner affect those engaged or employed in the Work, or the materials and equipment used in the Work, or which in any way affect the conduct of the Work, and all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. If any discrepancy or inconsistency is discovered in the Drawings, Specifications, or in any other part of this Contract, in relation to any such law, ordinance, regulation, order or decree, the Contractor shall immediately report the same to the Owner Representative in writing. The Contractor shall at all times observe and comply with all such existing and future laws, ordinances, regulations, orders and decrees; and shall protect, indemnify, defend and hold harmless the Owner, the Owner Representative, the Design Consultant, and all of their officers, officials, employees, agents, volunteers, and servants against any claim or liability arising from or based upon the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor itself, its employees, subcontractors, suppliers or others acting on the Contractor's behalf.

Prevailing Wages, Labor Compliance, Apprenticeship

All Contractors and Subcontractors providing workers or performing work on the Project shall comply with California Labor Code Sections 1771.1, 1771.7 and all other applicable labor requirements in Section 5-B Prevailing Wages and Labor Compliance.

Workers' Compensation Insurance

The Contractor and all subcontractors are required to comply with the requirements of California Labor Code Section 3700 concerning Workers Compensation Insurance in accordance with the Workers' Compensation Insurance and Safety Act and all other applicable requirements in Section 5-C Workers' Compensation Insurance.

SAFETY

The Contractor shall be solely and completely responsible for conditions of the job site, including the safety of all persons and property during the performance of the Work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), the California Occupational Safety and Health Act (CalOSHA), and all other applicable Federal, State, County, and local laws, ordinances, codes, including but not limited to the requirements set forth below, and any regulations that may be detailed in other parts of these Contract Documents. In the event of conflicting requirements, the most stringent requirement as it pertains to the Contractor's

safety responsibility shall be followed by the Contractor. The Contractor shall indemnify, defend and hold Owner and Owner Representative, Design Consultant and their respective officers, officials, employees, agents, and volunteers or other authorized representatives harmless to the full extent permitted by law concerning liability related to the Contractor's safety obligations.

The Contractor shall maintain a Drug-Free workplace policy within the Project site for the safety of its employees, the Owner's, Owner Representative's, and Design Consultant's employees and the public. The Drug-Free workplace policy shall be posted on the Construction site. The Contractor shall notify the Owner Representative of any criminal drug statute violation occurring on the site not later than five (5) days after the Contractor becomes aware of such violation.

The Contractor's compliance with requirements for safety and/or the Owner Representative's review of the Contractor's Safety Program shall not relieve or decrease the liability of the Contractor for safety. The Owner Representative's review of the Contractor's Safety Program is only to determine if the above-listed elements are included in the program.

SAFETY STANDARDS

Asbestos-Related Work - All work involving asbestos-containing material must be performed in accordance with California Labor Code, Sections 6501.5 through 6510, inclusive, and California Administrative Code, Title 8, Section 5208 and all other pertinent laws, rules, regulations, codes, ordinances, decrees and orders.

PUBLIC SAFETY AND CONVENIENCE

In accordance with the provisions of Section 6500 of the Labor Code, the Contractor shall conduct his work so as to ensure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the Work and to ensure the protection of persons and property. No road or street shall be closed to the public except with the permission of the Owner's Representative and the proper governmental authority. Fire hydrants on or adjacent to the Work shall be accessible to firefighting equipment. Temporary provisions shall be made by the Contractor to ensure the use of sidewalks, private and public driveways and proper functioning of gutters, sewer inlets, drainage ditches and culverts, irrigation ditches and natural watercourses. To the maximum extent permitted by law, Contractor shall indemnify, hold harmless and defend Owner from any and all liability, including attorneys' fees and costs of litigation, arising from any failure to comply with this section by Contractor or its privities.

COMPLIANCE WITH ENVIRONMENTAL LAWS

During construction, the Contractor shall comply with all pertinent requirements of Federal, State, and local environmental laws and regulations, including, but not limited to, the Federal Clean Air Act, State and local air pollution and noise ordinances, and construction site erosion control regulations, if applicable.

PROVISIONS FOR HANDLING EMERGENCIES

It is possible that emergencies may arise during the progress of the Work, which may require special treatment or make advisable extra shifts of labor forces to continue the Work for twenty-four (24) hours per day. These emergencies may be caused by damage or possible damage to nearby existing structures or property by reason of the work under construction, or by storm, accidents, or leakage. The Contractor shall be prepared in case of such emergencies to make all necessary repairs and shall promptly execute such work when required by the Owner Representative. The determinations made by the Owner Representative for handling emergencies shall be final and conclusive upon the parties. Upon start of the Work, Contractor shall provide means for immediate emergency notification of Contractor's designated representative and designated emergency alternates.

COOPERATION WITH OTHER CONTRACTORS

This Section shall serve as notice to the Contractor that the Owner may let other contracts for other work at or near the site of this work. The Contractor shall afford other contractors reasonable opportunity for the delivery and storage of their materials and the execution of their work, and shall properly connect and coordinate its work with theirs. Should construction be underway by other forces or by other contractors within or adjacent to the limits of the work or in the vicinity of the work to be done under this Contract, the Contractor shall so conduct its operations as to interfere to the least possible extent with the work of such other forces or contractors. Any difference or conflicts which may arise between the Contractor and any other forces or contractors, creating delays or hindrance to each other, shall be adjusted as determined by the Owner's Representative.

CONTROL OF WORK AND MATERIAL

The means, methods, and appliances adopted by the Contractor shall be planned and executed to produce the highest-grade quality of work and will enable the Contractor to complete the Work in the time agreed upon. The Owner and the Owner Representative shall not supervise, direct, or have control over, or be responsible for, Contractor's means, methods and appliances of construction or for the safety precautions and programs incident thereto, or for any failure

of Contractor to comply with laws and regulations applicable to the furnishing or performance of Work. However, if at any time the means, methods and appliances appear inadequate or of inferior quality, the Owner Representative may order the Contractor to improve their character or efficiency, and the Contractor shall conform to such order; failure of the Owner Representative to order such improvement of methods of efficiency will not relieve the Contractor from its obligation to perform satisfactory work and to finish the Work in the time agreed upon.

CHARACTER OF WORKERS

None but competent superintendents, forepersons and workers shall be employed on the Work. The Contractor shall remove from the Work any person who commits trespass, possesses firearms or other weaponry, is under the influence or is in the possession of alcohol or other illegal drugs/controlled substance, or is, in the opinion of the Contractor or Owner Representative, disorderly, dangerous, insubordinate, incompetent, or otherwise objectionable. Such discharge shall not be the basis of any claim for compensation or damages against the Owner, its officers, officials, employees, agents, and volunteers, the Design Consultant, the Owner Representative, and their partners, officers, employees, agents or any of its officers or representatives.

SUPPLY OF SUFFICIENT WORKERS

The Contractor shall at all time employ qualified workers sufficient to prosecute the Work at a rate and in a sequence and manner necessary to complete the Work within the Contract Time(s). This obligation shall remain in full force and effect notwithstanding disputes or claims of any type.

MATERIALS AND WORKMANSHIP

Unless otherwise indicated in these Specifications, or favorably reviewed by the Design Consultant, materials and equipment for the construction work shall be the best grade in quality of a manufacturer regularly engaged in the production of such materials and equipment or materials and equipment of comparable character. All materials must be of the specified quality and equal to approved samples, if samples have been submitted. All work shall be done and completed in the best workmanlike manner, obtainable in the local market. All permanent materials and equipment shall be new unless otherwise specified.

All defective work or materials shall be promptly removed from the premises by the Contractor, whether in place or not, and shall be replaced or renewed in such manner as the Owner Representative may direct. All materials and workmanship of whatever description shall be

subjected to the inspection of and rejection by, the Owner Representative if not in conformance with the Contract Documents. The decision of the Owner Representative is final and conclusive upon the parties.

Any defective material or workmanship, or any unsatisfactory or imperfect work which may be discovered before the final acceptance of the work or within one (1) year thereafter, shall be corrected immediately upon the receipt of notice from the Owner Representative, without extra charge, notwithstanding that it may have been overlooked in previous inspections and estimates. Failure to inspect work shall not relieve the Contractor from any obligation to perform sound and reliable work as herein described.

UTILITY LOCATION

It shall be the Contractor's responsibility to determine the exact location and depth of all utilities, including service connections. The Contractor shall not be entitled to additional compensation or time extensions for work necessary to avoid interferences nor for repair to damaged utilities if the Contractor does not expose all such existing utilities as required by this section. Temporary or permanent relocation or alteration of utilities desired by the Contractor for its own convenience shall be the Contractor's responsibility and it shall make arrangements and bear all costs for such work.

PROGRESS OF THE WORK

Time is of the essence in the performance of this Contract. The Contractor shall prosecute the work so that the various portions of the project shall be complete and ready for use within the time specified in the Contract Documents. It is expressly understood and agreed by and between the Contractor and the Owner that the Contract Time for completion of the work described herein is a reasonable time taking into consideration the general climatic and economic conditions and other factors prevailing in the locality and the nature of the work. The Contractor is hereby advised that the Contractor's bid is to be based on the entire Contract Time and the Contractor shall include its field and home office overhead costs in the bid for the entire Contract Time.

NOTICE OF DELAYS

When the Contractor foresees a delay in the prosecution of the Work and, in any event, immediately upon the occurrence of a delay, the Contractor shall notify the Owner Representative in writing of the probability of the occurrence of the delay, and its cause. The Contractor shall provide this notice no later than two (2) calendar days after the occurrence of such delay, including weather delays as specified herein. The Contractor shall take immediate

steps to prevent, if possible the occurrence or continuance of the delay. The Contractor agrees that no claim shall be made for delays which the Owner Representative is not notified of within the time specified herein. Contractor further agrees that Contractor shall not be permitted any additional time for completion of the Work or any additional compensation as a result of delay unless Contractor notifies the Owner Representative of the delay within the time specified herein.

Non-Excusable Delays

Non-excusable delays in the prosecution of the Work shall include delays which could have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its subcontractors, at any tier level, or suppliers. The Contractor shall receive no compensation or time extension for such delay.

Excusable Delays

Excusable delays in the prosecution or completion of the Work shall include delays which result from causes beyond the control of the Contractor and Owner and which could not have been avoided by the exercise of care, prudence, foresight, and diligence on the part of the Contractor or its subcontractors, at any tier level, or suppliers. The Contractor shall receive no compensation for such delay.

Abnormal Delays

Delays caused by fire, unusual storms, floods, tidal waves, earthquakes, strikes, labor disputes, freight embargoes, and shortages of materials shall be considered as excusable delays insofar as they prevent the Contractor from proceeding with the Work for at least five (5) hours per day toward completion of the current critical activity item(s) on the latest favorably reviewed progress schedule.

Weather Delays

Should inclement weather conditions or the conditions resulting from weather prevent the Contractor from proceeding with seventy-five (75%) percent of the normal labor and equipment force for at least five (5) hours per day toward completion of the current critical activity item(s) on the latest favorably reviewed progress schedule it shall be a weather delay day. The Contractor may be granted a time extension for such delay.

Material Shortages

Upon the submission of satisfactory proof to the Owner Representative by the Contractor, shortages of material may be acceptable as grounds for granting a time extension. In order that such proof may be satisfactory and acceptable to the Owner Representative, it must be demonstrated by the Contractor that the Contractor has made every effort to obtain such

materials from all known sources within reasonable reach of the proposed Work. Only the physical shortage of material, caused by unusual circumstances, will be considered under these provisions as a cause for extension of time, and no consideration will be given to any claim that material could not be obtained at a reasonable, practical, or economical cost or price, unless it is shown to the satisfaction of the Owner Representative that such material could have been obtained only at exorbitant prices entirely out of line with current rates, taking into account the quantities involved and usual practices in obtaining such quantities. A time extension for a shortage of material will not be considered for material ordered or delivered late or whose availability is affected by virtue of the mishandling of procurement. The above provisions apply equally to equipment to be installed in the work.

TIME EXTENSIONS

Non-Excusable Delays

The Owner, at its sole option, may grant an extension of time for milestone or completion dates for non-excusable delays if the Owner deems it is in its best interest. If the Owner grants an extension of time for non-excusable delays, the Contractor agrees to pay the Owner's actual costs, arising from the delay, including charges for engineering, inspection, and administration incurred during the extension, as determined by Owner.

Excusable or Compensable Delays

If the Contractor is delayed in the performance of its work due to Excusable or Compensable Delays, then milestone and Contract completion dates may be extended by the Owner for such time that, in the Owner Representative's determination, the Contractor's completion dates will be delayed, provided that the Contractor strictly fulfills the following: The Contractor shall provide timely notification and submit in writing a request for an extension of time to the Owner Representative stating at a minimum the probable cause of the delay and the number of days being requested. The Owner may require a time impact analysis. If requested by the Owner Representative, the Contractor shall promptly provide sufficient information to the Owner Representative to assess the cause or effect of the alleged delay, or to determine if other concurrent delays affected the Work.

Weather Delays

The Contractor may be granted a non-compensable time extension for weather caused delays which meet the criteria above. Should the Contractor fail to fulfill any of the foregoing, which are conditions precedent to the right to receive a time extension, the Contractor waives the right to receive a time extension.

It is understood and agreed by the Contractor and Owner that time extensions due to excusable

or compensable delays will be granted only if such delays involve an impact to the critical path that would prevent completion of the whole Work within the specified Contract time.

LIQUIDATED DAMAGES

Should the Contractor fail to complete the Work within the time specified in the Contract, as extended in accordance with this section if applicable, the Contractor shall forfeit and the Owner may recover liquidated damages. Owner and the Contractor recognize that time is of the essence of this Contract and that the Owner will suffer financial loss if the Work is not completed within the time specified in the Contract. It is hereby understood and agreed that it is and will be difficult and/or impossible to ascertain and determine the actual damage which the Owner will sustain in the event of and by reason of the Contractor's failure to fully perform the Work or to fully perform all of its contractual obligations that have accrued by the time for completion. It is, therefore, agreed in accordance with California Government Code Section 53069.85 that the Contractor will forfeit and pay to the Owner liquidated damages in the amount set forth in the Contract Documents, per day for each and every calendar day that expires after the time for completion in the Contract Documents. It is further understood and agreed in accordance with California Government Code Section 53069.85 that the liquidated damages sum specified in this provision is not manifestly unreasonable under the circumstances existing at the time this Contract was made, and that the Owner may deduct liquidated damages sums in accordance with this provision from any payments due or that may become due the Contractor. Liquidated damages will continue to accrue at the stated rate until substantial completion of the Work. Accrued liquidated damages may be deducted by the Owner from amounts due or that become due to the Contractor for performance of the Work.

SUSPENSION OF WORK

If the Contractor fails to correct defective work, Supply of Sufficient Workers, or fails to carry out the Work in accordance with the Contract Documents or any other applicable rules and regulations, the Owner, by a written order of the Owner's representative or signed personally by an agent specifically so empowered by the Owner, in writing, may order the Contractor to stop the work, in its entirety or any portion thereof. In the event of a suspension of only a portion of the work, the Contractor is obligated to perform the portion of the work not suspended. The Suspension of Work shall remain in effect until the condition or cause for such order has been eliminated. The Owner's concurrence that the condition or cause has been eliminated will be provided to the Contractor in writing. This right of the Owner to stop and suspend the Work shall not give rise to any duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity. All delays in the Work

occasioned by such stoppage shall not relieve the Contractor of any duty to perform the Work or serve to extend the time for its completion. Any and all necessary corrective work done in order to comply with the Contract Documents shall be performed at no cost to the Owner.

In the event that a suspension of Work is ordered, as provided in this paragraph, the Contractor, at its expense, shall perform all work necessary to provide a safe, smooth, and unobstructed passageway through construction for use by public, pedestrian, and vehicular traffic, during the period of such use by suspension. Should the Contractor fail to perform the Work as specified, the Owner may perform such work and the cost thereof may be deducted from partial payments and/or final payment due to the Contractor under the Contract.

The Owner shall also have authority to suspend the Work wholly or in part, for such period as the Owner may deem necessary, due to unsuitable weather, or to such other conditions as are considered unfavorable for the suitable prosecution of the Work. Such temporary suspension of the Work will be considered justification for time extensions to the Contract in an amount equal to the period of such suspension if such suspended work includes the current critical activity on the latest favorably reviewed progress schedule.

RIGHT TO TERMINATE CONTRACT

If at any time the Contractor is determined to be in material breach of the Contract, notice thereof in writing will be served upon the Contractor and its sureties, and should the Contractor neglect or refuse to propose and effect a means for a satisfactory compliance with the Contract, as directed by the Owner Representative, within the time specified in such notice, the Owner or the Owner's Representative in such case shall have the authority to terminate the operation of the Contract.

Upon such termination, the Contractor shall discontinue the Work or such parts of it as the Owner may designate. Upon such termination, the Contractor's control shall terminate and thereupon the Owner or its fully authorized representative may take possession of all or any part of the Contractor's materials, tools, equipment, and appliances upon the premises and use the same for the purposes of completing the Work and hire such force and buy or rent such additional machinery, tools, appliances, and equipment, and buy such additional materials and supplies at the Contractor's expense as may be necessary for the proper conduct of the Work and for the completion thereof; or the Owner may employ other parties to carry the Contract to completion, employ the necessary workers, substitute other machinery or materials and purchase the materials contracted for, in such manner as the Owner may deem proper; or the Owner may annul and cancel the Contract and release the Work or any part thereof. Any excess of cost arising therefrom over and above the Contract Price will be charged against the

Contractor and its sureties, who will be liable therefor.

In the event of such termination, all monies due to the Contractor or retained under the terms of this Contract shall be held by the Owner; however, such holdings will not release the Contractor or its sureties from liability for failure to fulfill the Contract. Any excess cost over and above the Contract Amount incurred by the Owner arising from the termination of the operations of the Contract and the completion of the Work by the Owner as above provided shall be paid for by the Contractor. The Contractor shall be entitled to credit against such excess costs and contract funds held by the Owner. Any contract funds remaining after all valid claims for completion of the Work have been paid shall be paid to the Contractor sixty (60) days after completion of the Work.

If at any time before completion of the work under the Contract, it shall be determined by the Owner that reasons beyond the control of the parties hereto render it impossible, impractical, undesirable, or otherwise against the interests of the Owner to complete the work, or if the work shall be stopped by an injunction of a court of competent jurisdiction or by order of any competent authority, the Owner may, upon ten (10) days written notice to the Contractor, discontinue the work and terminate the Contract for its convenience. Upon service of such notice of termination, the Contractor shall discontinue the work in such manner, sequence, and at such times as the Owner Representative may direct. The Contractor shall have no claim for damages for such discontinuance or termination, nor any claim for anticipated profits on the work thus dispensed with, nor any other claim except for the work actually performed in accordance with the Contract Documents up to the time of discontinuance, including any extra work ordered by the Owner Representative to be done, nor for any claim for liquidated damages.

CHANGE ORDERS

Without invalidating the Contract and without notice to sureties or insurers, the Owner through the Owner Representative, may at any time or from time to time, order additions, deletions, or revisions in the Work; these will be authorized by Field Order or Change Order. By the acceptance of a Change Order, the Contractor waives any claim for additional time, not included in the Change Order, for the work covered by that Change Order. Additional or extra work performed by the Contractor without written authorization of a Field Order or Change Order will not entitle the Contractor to an increase in the Contract Amount or an extension of the Contract Time.

Compensable extra work shall be that work required for the completed project, but not shown, detailed or specified in the Contract Documents. Such work shall be governed by all applicable

provisions of the Contract Documents. In giving instructions, the Owner Representative shall have authority to make minor changes in the Work, not involving extra cost, and not inconsistent with the purposes of the Work; but otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless in pursuance of a written order by the Owner through the Owner Representative, and no claim for an addition to the Contract Amount and/or Contract Time shall be valid unless so ordered.

In case any change increases or decreases the work shown, the Contractor shall be paid for the work actually done at a mutually agreed upon adjustment to the Contract Price.

If the Contractor refuses to accept a Change Order, the Owner may issue it unilaterally. The Contractor shall comply with the requirements of the Change Order. The Owner shall provide for an equitable adjustment to the Contract Price and/or Contract Time, and compensate the Contractor accordingly. If the Contractor does not agree that the adjustment is equitable, it may submit claim through a dispute resolution procedure.

DIFFERING SITE CONDITIONS

Pursuant to Public Contract Code Section 7104, the Contractor shall promptly, and before such conditions are disturbed, notify the Owner Representative in writing, of any:

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

Subsurface or latent physical conditions at the site differing from those indicated in the Contract Documents.

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

The Owner shall promptly investigate the conditions, and if it finds that the conditions do materially differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or the time required for, performance of any part of the Work the Owner shall cause to be issued a change order under the procedures relating to Change Orders.

In the event that a dispute arises between the Owner and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work the Contractor

shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

PAYMENT

General

The Contractor shall accept the compensation, as herein provided, as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to the completed Work and for performing all work contemplated and embraced under the Contract; also for loss or damage arising from the nature of the Work, or from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the Work, also for all expenses incurred in consequence of the suspension or discontinuance of the Work as herein specified; and for completing the Work according to the Contract Documents. Neither the payment of any estimate nor of any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.

No compensation will be made in case of loss of anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as provided in such agreements.

Full compensation for conforming to all of the provisions of the Contract Documents shall be considered as included in the prices paid for the various Contract items of work and no additional compensation will be allowed therefor.

Payment of Taxes

The Contractor shall pay and shall assume exclusive liability for all taxes levied or assessed on or in connection with its performance of this Contract, whether before or after acceptance of the work, including, but not limited to, State and local sales and use taxes, Federal and State payroll taxes or assessments, and excise taxes, including any taxes or assessments, levied or increased during the performance period of the work. No separate allowance will be made therefor, and all costs in connection therewith shall be included in the total amount of the Contract price.

Progress or Partial Payments

In consideration of the faithful performance of the Work prosecuted in accordance with the Contract Documents, the Owner will pay the Contractor for all such work installed on the basis of unit prices and/or percentage completion.

Payments will be made by the Owner to the Contractor on estimates duly certified and approved by the Owner Representative, based on the Lump Sum or unit price value of

equipment installed and tested, labor and materials incorporated into said permanent work by the Contractor during the preceding month, and acceptable materials and equipment on hand (materials and equipment furnished and delivered to the site by the Contractor and not yet incorporated into the work accompanied by an approved invoice). Payments will not be made for temporary construction unless specifically provided for in the Contract Documents.

Partial payments will be made monthly based on work accomplished as of a day mutually agreed to by the Owner and the Contractor.

The Contractor shall submit a completed and signed progress payment request form with its estimate of the work completed during the prior month and the work completed to date in a format corresponding to the unit price schedule and accepted cost breakdown. Additionally, the Contractor shall submit a detailed statement of the Contractor's request for payment of acceptable materials and equipment on hand. Each payment request shall list each Change Order executed prior to date of submission, including the Change Order Number.

Contractor shall certify each payment request stating that the Contractor has met all requirements of the Contract Documents for all amounts included in the payment request and that all work included in the payment request has been performed in accordance with the Contract Documents.

Upon receipt of Contractor's requests for payment, the Owner shall act in accordance with the following: The Owner Representative shall review the submitted estimates, as soon as practicable after receipt for the purpose of determining that the estimates are a proper request for payment, and shall prepare a certified estimate of the total amount of work done and acceptable materials and equipment on hand.

If requested, the Contractor shall provide such additional data as may be reasonably required to support the partial payment request. The Owner Representative will adjust or correct the payment request and will be available to meet and discuss the partial payment request prior to its resubmittal(s). When the Contractor's estimate of amount earned conforms to the Owner Representative's evaluation, the Contractor shall submit to the Owner Representative a properly completed and signed progress payment request. The Owner Representative will submit the recommended progress payment request for the Owner's approval and processing. Payment will be made by the Owner to the Contractor in accordance with Owner's normal accounts payable procedures; the Owner shall retain retention from the payment.

Each progress payment request and the final payment request shall be deemed "proper" only if it is submitted on the form approved by the Owner, with all of the requested information

completely and accurately provided by the Contractor and such completed progress payment request form or final payment request form is accompanied by (i) certified payrolls of the Contractor and all Subcontractors, of any tier, for laborers performing any portion of the Work for which a progress payment or final payment is requested; (ii) duly completed and executed Conditional Waiver and Release Upon Progress Payment or Final Payment forms in accordance with California Civil Code 8132 for all Subcontractors of any tier, and Material Suppliers covering the progress payment or final payment requested; (iii) duly completed and executed Unconditional Waiver and Release Upon Progress Payment forms in accordance with California Civil Code 8136 and 8138 for all Subcontractors of any tier, and Material Suppliers covering the Progress Payment received by the Contractor under the prior progress payment request.

Right to Withhold Amounts

The Owner will withhold from each of the partial payments and retain as part security, five (5) percent of the amount earned until the final payment in accordance with Public Contract Code Section 7201.

Other Withholds

In addition to the amount which the Owner may otherwise retain under the Contract, the Owner may withhold a sufficient amount or amounts of any payment or payments otherwise due to the Contractor, as in its judgment may be necessary to cover:

- A. For defective work not remedied.
- B. A reasonable doubt that the Contract can be completed for the balance then unpaid.
- C. Damage to another contractor or third party, or to property.
- D. Cost of insurance arranged by the Owner due to cancellation or reduction of the Contractor's insurance.
- E. Failure to make proper submissions, as specified herein.
- F. Payments due to the Owner from the Contractor.
- G. Reduction of Contract Amount because of modifications.
- H. The Contractor's neglect or unsatisfactory prosecution of the Work including additional engineering and administrative costs related to construction and/or shop drawing errors and the failure to clean up.
- I. Provisions of law that enable or require the Owner to withhold such payments in whole or in part.
- J. Stop Notice claims filed by Contractor's subcontractors, of any tier, or its material

suppliers.

- K. Failure of Contractor to submit Operation and Maintenance Manuals.
- L. Failure to comply with legal, environmental or other regulatory requirements.
- M. When the above reasons for withholding amounts are removed, payment will be made to the Contractor for amounts withheld because of them.
- N. The Owner in its discretion may apply any withheld amount or amounts to the payment of valid claims. In so doing, Owner shall be deemed the agent of Contractor, and any payment so made by the Owner shall be considered as a payment made under the Contract by the Owner to the Contractor and the Owner shall not be liable to the Contractor for such payment made in good faith. Such payments may be made without prior judicial determination of the claim or claims. The Owner will render to the Contractor a proper accounting of such funds disbursed in behalf of Contractor.

AUDIT AND EXAMINATION OF RECORDS

The Owner may examine and audit at its own cost and expense all books, estimates, records, contracts, documents, bid documents, bid cost data, subcontract job cost reports and other Work related data of the Contractor, subcontractors engaged in performance of the Work, and suppliers providing supplies, equipment and other materials required for the Work, including computations and projections related to bidding, negotiating, pricing or performing the Work or Contract modifications and other materials concerning the Work, including, but not limited to, Contractor daily logs, in order to evaluate the accuracy, completeness, and currency of cost, pricing, scheduling and any other Work-related data. The Contractor will make available all such Work-related data at all reasonable times for examination, audit, or reproduction at the Contractor's business office at or near the Worksite, and at any other location where such Work-related data may be kept until three years after final payment under the Contract. Pursuant to California Government Code Section 8546.7, if the amount of public funds to be expended is in excess of \$10,000, this Contract will be subject to the examination and audit of the State Auditor, at the request of the Owner, or as part of any audit of the Owner, for a period of three (3) years after final payment under the Contract.

SECURITY SUBSTITUTION FOR WITHHOLDS

Pursuant to Public Contract Code Section 22300 (the provisions of which are hereby incorporated herein by reference), the Contractor may substitute securities for any moneys withheld by the Owner as retention. Section 7 – Project Forms.

WARRANTY OF TITLE

No material, supplies, or equipment for the Work under this Contract shall be purchased subject to any chattel mortgage, security agreement, or under a conditional sale or other agreement by which an interest therein or any part thereof is retained by the seller or supplier. The Contractor warrants good title to all material, supplies, and equipment installed or incorporated in the work and agrees upon completion of all work to deliver the premises, together with all improvements and appurtenances constructed or placed thereon by the Contractor, to the Owner free from any claims, liens, security interests, or charges. The Contractor further agrees that neither the Contractor nor any person, firm, or corporation furnishing any materials or labor for any work covered by this Contract shall have any right to a lien upon the premises or any improvement or appurtenances thereon, provided that this shall not preclude the Contractor from installing metering devices and other equipment of utility companies or of municipalities, the title of which is commonly retained by the utility company or the municipality. In the event of the installation of any such metering device or equipment, the Contractor shall advise the Owner as to the legal Owner thereof.

SUBSTANTIAL COMPLETION

When the Contractor considers that the Work or portion of the Work is substantially complete, the Contractor shall notify the Owner Representative in writing. Upon receipt of the notification, the Owner Representative, the Owner, the Design Consultant and/or their authorized representatives will make inspection, to determine if the Work and administrative requirements are sufficiently complete in accordance with the Contract Documents so the Owner can occupy or utilize the Work for its intended use. If items are found which prevent such use or occupancy, the Owner Representative shall notify the Contractor in writing of such items by issuing a Corrective Work Item List.

Upon the completion of such corrective work, the Contractor shall so notify the Owner Representative in writing. The Owner Representative, the Owner and/or the Design Consultant shall inspect the Work to determine its acceptability for Substantial Completion and for determination of other items which do not meet the terms of the Contract. Upon verification that the Work is substantially complete the Owner Representative shall prepare a Certificate of Substantial Completion and the Punch List. The Certificate shall establish the date of Substantial Completion and the responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance, commencement of warranties required by the Contract Documents, and shall fix the time, not to exceed ninety (90) days, within which the Contractor shall finish all items on the Punch List or remaining work or administrative

requirements accompanying the Certificate. When the preceding provisions have been approved by both the Owner and the Contractor, they shall sign the Certificate to acknowledge their written acceptance of the responsibilities assigned to them in such Certificate. By such acknowledgment, the Owner has the right to retain, in accordance with applicable law, withheld monies due the Contractor to pay the Owner's actual costs including, but not limited to, charges for engineering, inspection, and administration incurred due to the failure to complete the Punch List within the time period provided in the Certificate of Substantial Completion, which costs the Owner may deduct from amounts due or that may become due the Contractor under the Contract.

FINAL CLEANUP

On all building projects and wherever else applicable, besides final site cleanup, the following special cleaning shall be performed at the completion of the Work:

- A. Putty stains and paint shall be removed from glass; the glass shall be washed inside and outside. Care shall be exercised so as not to scratch glass.
- B. Marks, stains, fingerprints, and other soil and dirt shall be removed from painted, decorated, or stained work.
- C. Waxed woodwork shall be cleaned and polished.
- D. Hardware shall be cleaned and polished of all traces; this shall include removal of stains, dust, dirt, paints, and blemishes.
- E. Spots, soil, paint, plaster, and concrete shall be removed from tile; tile work shall be washed afterwards.
- F. Fixtures, equipment, and visible piping and ducts shall be cleaned, and stains, paint, dirt, and dust shall be removed.
- G. Temporary floor protections shall be removed; floors shall be cleaned, waxed, and buffed.
- H. Dust, cobwebs, and traces of insects and dirt shall be removed.
- I. Marred surfaces shall be repaired, patched, and touched up to specified finish to match adjacent surfaces.
- J. All interior spaces including inside cabinets shall be vacuum cleaned.
- K. Air handling filters and light bulbs shall be replaced if units were operated during construction. Ducts, blowers, and coils shall be cleaned if air-handling units were

operated without filters during construction.

- L. All other cleaning applicable to the work performed on the Project in order to convey to the Owner a sanitary, orderly, and aesthetically acceptable facility.

FINAL INSPECTION AND PAYMENT

Upon completion of the Work, including all items on the Punch List, and upon completion of final cleaning, the Contractor shall so notify the Owner Representative in writing. Upon receipt of the notification, the Owner Representative, the Owner and/or their authorized representatives will make the final inspection, to determine the actual status of the Work in accordance with the terms of the Contract. If materials, equipment, workmanship or administrative requirements are found which do not meet the terms of the Contract, the Owner Representative shall prepare a Final Inspection List of such items and submit it to the Contractor. Following completion of the work to correct all items in the Final Inspection List, the Contractor shall notify the Owner Representative. The Owner Representative shall, in turn, notify the Owner that the Work has been completed in accordance with the Contract. Final determination of the acceptability of the Work shall be made by the Owner. After completion of the work, but prior to its acceptance by the Owner, the last partial payment will be made to the Contractor.

After receipt of the last partial payment, but prior to acceptance of the Work by the Owner, the Contractor shall send a letter to the Owner Representative. The letter, pursuant to California Public Contract Code Section 7100, shall state that acceptance of the final payment described below shall operate as and shall be, a release to the Owner, the Owner Representative, the Design Consultant, and their duly authorized agents, from all claim of and/or liability to the Contract arising by virtue of the Contract related to undisputed contract amounts. Disputed Contract claims in stated amounts previously filed as provided in, Resolution of Disputes may be specifically excluded by the Contractor from the operation of the release.

Following receipt of all required submittals and the Owner Representative's written statement that construction is complete and recommendation that the Owner accepts the project, the Owner will take formal action on acceptance.

Within ten (10) days of the acceptance by the Owner of the completed work embraced in the Contract Documents, the Owner will cause to be recorded in the office of the County Recorder a Notice of Completion.

Within sixty (60) days after recording the Notice of Completion of the Work involved in the Contract, the Owner will pay the Contractor in lawful money such sums of money as may be due the Contractor and are undisputed including all sums retained but excluding such sums as have previously been paid the Contractor. This payment will constitute the final payment to the Contractor under this Contract. Upon receipt of such payment, the Contractor shall send Owner an "unconditional waiver and release upon final payment" properly executed in

accordance with California Civil Code Section 8136.

The Owner will pay the Contractor in lawful money such sums of money as may be due the Contractor including all sums retained but excluding such sums as have previously been paid the Contractor and as may be needed to cover outstanding stop notices. This payment will constitute the final payment to the Contractor under this Contract.

In the event of a dispute between the Owner and the Contractor, the Owner may in accordance with Public Contract Code Section 7107 withhold from the final payment an amount of 150 percent of the disputed amount.

WARRANTY AND GUARANTY

The Contractor guarantees all construction performed on this Project and also guarantees all material and equipment incorporated therein. Contractor hereby grants to County for a period of two years following the date of Final Acceptance of the Work completed, or such longer period specified in the Contract Documents, its unconditional warranty of the quality and adequacy of all of the Work including, without limitation, all labor, materials and equipment provided by Contractor and its Subcontractors of all tiers in connection with the Work. Neither final payment nor use nor occupancy of the Work performed by the Contractor shall constitute an acceptance of Work not done in accordance with this Guaranty or relieve Contractor of liability in respect to any express warranties or responsibilities for faulty materials or workmanship. Contractor shall remedy any defects in the Work and pay for any damage resulting therefrom, which shall appear within one year, or longer if specified, from the date of Final Acceptance of the Work completed. If within two year after the date of Final Acceptance of the Work completed, or such longer period of time as may be prescribed by laws or regulations, or by the terms of Contract Documents, any Work is found to be Defective, Contractor shall promptly, without cost to County and in accordance with County's written instructions, correct such Defective Work. Contractor shall remove any Defective Work rejected by County and replace it with Work that is not Defective, and satisfactorily correct or remove and replace any damage to other Work or the work of others resulting therefrom. If Contractor fails to promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, County may have the Defective Work corrected or the rejected Work removed and replaced. Contractor shall pay for all claims, costs, losses, and damages caused by or resulting from such removal and replacement. Where Contractor fails to correct Defective Work, or defects are discovered outside the correction period, County shall have all rights and remedies granted by law. Inspection of the Work shall not relieve Contractor of any of its obligations under the Contract Documents. Even though

equipment, materials, or Work required to be provided under the Contract Documents have been inspected, accepted, and estimated for payment, Contractor shall, at its own expense, replace or repair any such equipment, material, or Work found to be Defective or otherwise not to comply with the requirements of the Contract Documents up to the end of the guaranty period. The foregoing Guaranty is in addition to any manufacturer's warranty. In the event of any conflict or inconsistency between the terms of this Guaranty and any warranty or obligation of the Contractor under the Contract Documents or at law, such inconsistency or conflict shall be resolved in favor of the higher level of obligation of the Contractor. Contractor shall provide a Warranty Bond to secure the performance of the Warranty and Guaranty set forth herein.

PUBLIC RECORDS ACT

Except as otherwise provided herein, all records, documents, drawings, plans, specifications, and all other information relating to the conduct of Owner's business, including information submitted by the Contractor ("Records"), shall become the exclusive property of Owner and shall be deemed public records. Said Records are subject to the provisions of the California Public Records Act (Government Code § 6250 et. seq.). The Owner's use and disclosure of its records are governed by this Act.

END OF DOCUMENT

5-B PREVAILING WAGES AND LABOR COMPLIANCE

Contractor and Subcontractors are responsible for complying with each and every applicable prevailing wage law and labor compliance requirements.

LABOR COMPLIANCE PROGRAM

Pursuant to public contract code section 221600, owner's labor compliance shall be monitored by the California Department of Industrial Relations.

All Contractors and Subcontractors providing workers or performing work on the Project shall comply with California Labor Code Sections 1771.1, 1771.7 and all other applicable labor requirements.

All contractors and subcontractors providing workers or performing work on the project shall comply with all applicable wage and hour laws.

WAGE RATES

Copies of the general prevailing rates of per diem wages for each craft, classification, or type of worker needed to execute the contract, as determined by director of the state of California Department of Industrial Relations, are on file at owner's offices located at 2 Civic Center Drive, Scotts Valley, CA 95066. Upon request, the owner will make available copies to any interested party.

Contractor shall post the applicable prevailing wage rates at each Project construction site.

NO DUTY TO CONTRACTOR OR SUBCONTRACTOR

The duty of owner to carry out its labor compliance program runs solely to the director of the California Department of Industrial Relations and not to any worker, contractor, subcontractor or other party.

PAYMENT OF PREVAILING WAGE RATES

Contractor shall pay to persons performing labor in and about Work provided for in the Contract Documents an amount equal to or more than the general prevailing rate of per diem wages for (1) work of a similar character in the locality in which the Work is performed and (2) legal holiday and overtime work in said locality. The per diem wages shall be an amount equal to or more than the stipulated rates contained in a schedule that has been ascertained and determined by the Director of the State Department of Industrial Relations and Owner to be the general prevailing rate of per diem wages for each craft or type of workman or mechanic

needed to execute this Contract.

Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall pay persons performing labor or rendering service under subcontract or other arrangement not less than the general prevailing rate of per diem wages for work of a similar character in the locality in which the Work is performed, and not less than the general prevailing rate of per diem wages for holiday and overtime work fixed in the California Labor Code.

The Contractor is responsible for ascertaining and complying with all current general prevailing wage rates for each craft, classification, or type of worker needed to execute the Contract including any rate changes that take effect during the term of the Contract.

The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall ascertain and comply with all current general prevailing wage rates for each craft, classification, or type of worker needed to perform the Work, including any rate changes that take effect during the term of such contract.

The limited exemption from paying prevailing wage rates pursuant to California Labor Code §1771.5 shall be applied to this Contract if the exemption criteria set forth therein are met.

LABOR CODE COMPLIANT PAYROLL RECORDS

Contractor must maintain accurate payroll records showing the name, address, social security number and work classification of each employee and owner performing Work on the Project. Contractor's payroll records shall also set forth the straight time and overtime hours worked each day and each week, the fringe benefits and the actual per diem wage paid to each owner, journeyman, apprentice worker or other employee employed in connection with the Project.

Each of Contractor's payroll record shall be verified by a written declaration that it is made under penalty of perjury and stating that the information contained in the payroll record is true and correct and that the Contractor has complied with the requirements of California Labor Code §§1771, 1811 and 1815 for any Work performed by the Contractor's employees on the Project.

The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall maintain accurate payroll records showing the name, address, social

security number and work classification of each employee and owner performing Work on the Project. Subcontractor's payroll records shall also set forth the straight time and overtime hours worked each day and each week, the fringe benefits and the actual per diem wage paid to each owner, journey person, apprentice worker or other employee employed in connection with the Project.

The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall verify by a written declaration that it is made under penalty of perjury and stating that the information contained in the payroll record is true and correct and that the Subcontractor has complied with the requirements of California Labor Code §§1771, 1811 and 1815 for any Work performed by the Subcontractor's employees on the Project.

PAYROLL RECORD AVAILABILITY

The Contractor shall make available for inspection at all reasonable hours at the principal office of the Contractor, or shall furnish a certified copy, of all Contractor's payroll records for its employees employed in connection with the Work upon request by an employee, employee representative, Owner, the Compliance Administrator or any other Owner representative, The Division of Labor Standards.

The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall make available for inspection at all reasonable hours at the principal office of the Subcontractor, or shall furnish a certified copy of all Subcontractor's payroll records for its employees employed in connection with the Work upon request by an employee, employee representative, Owner, the Compliance Administrator or any other Owner representative, The Division of Labor Standards.

If the principal office of the Contractor or Subcontractor is more than twenty-five miles from the Project site, upon request from Owner, the Compliance Administrator or any other Owner representative or a worker employee, Contractor or Subcontractor shall make a certified copy of all Contractor's or Subcontractor's payroll records for its employees employed in connection with the Work available for inspection at Owner's office located at 2 Civic Center Dr, Scotts Valley, CA 95066.

SUBMISSION OF WEEKLY PAYROLL RECORDS

Contractor shall submit to the Compliance Administrator in the manner required by the Department of Industrial Relations a certified copy of all the Contractor's payroll records for its

employees employed in connection with the Work on a weekly basis. The certified payroll records for the preceding week shall be submitted on the Wednesday of the following week. In the event that a legal holiday falls on Wednesday, the certified payroll records shall be submitted on the next business day.

- A. If there was no work performed during a given week, Contractor's certified payroll record shall be annotated: "no work" for that week.
- B. Contractor shall mark "final" on its last submitted payroll for the Project.

The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall submit to the Compliance Administrator a certified copy of all the Subcontractor's payroll records for its employees employed in connection with the Work on a weekly basis. The certified payroll records for the preceding week shall be submitted on the **Wednesday** of the following week. In the event that a legal holiday falls on **Wednesday**, the certified payroll records shall be submitted on the next business day.

- A. If there was no work performed during a given week, Subcontractor's certified payroll record shall be annotated: "no work" for that week.
- B. Subcontractor shall mark "final" on its last submitted payroll for the Project.

AUDIT AND INVESTIGATION OF COMPLIANCE

Owner may conduct reasonable investigation of Contractor's and/or Subcontractor's compliance with the requirements of California Labor Code §§1771, 1775, 1777, 1811, 1813 and 1815 and any other applicable state or federal labor law. Not more than ten days after a written or oral request from Owner, Compliance Administrator or any other Owner representative, Contractor and/or Subcontractor shall provide legible copies of time cards, personnel sign-in sheets, daily logs payroll registers, paycheck stubs, cancelled paychecks or any other document requested to authenticate or corroborate compliance with prevailing wage rate laws. Contractor and/or Subcontractor shall make the originals of the requested documents available for inspection upon request by Owner, the Compliance Administrator or any other Owner representative at all reasonable hours at the principal office of the Contractor or Subcontractor or if the principal office of the Contractor or Subcontractor is more than 25 miles from the Project site, at Owner's offices at 2 Civic Center Dr, Scotts Valley, CA 95066.

Contractor and/or Subcontractor shall assist Owner, the Compliance Administrator or any other Owner representative with any investigation or audit of Contractor and/or Subcontractor

regarding compliance with the prevailing wage rate laws.

Contractor and/or Subcontractor shall make its employees available for interviews by Owner, the Compliance Administrator or any other Owner representative.

Neither Contractor nor Subcontractor shall take retaliatory measures against any worker on the Project for informing Owner or Compliance Administrator or Owner representative of, or responding to, any monitoring, investigation or audit of any violation or suspected violation of the prevailing wage rate laws.

Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, the same terms as set forth in this Document and each subpart thereto.

INADEQUATE OR DELINQUENT PAYROLL RECORDS

Payment under this Contract shall not be made when Contractor or Subcontractor payroll records are delinquent or inadequate.

Payroll records shall be considered delinquent if they are not submitted in compliance with this Document.

Payroll records shall also be considered delinquent if they are not submitted within ten days of any written request by Owner or Compliance Administrator or other Owner representative.

Payroll records shall be considered inadequate if one or more of the following conditions exist:

- A. The record lacks the information required by California Labor Code §1776; or
- B. The record contains the information required by California Labor Code §1776 but is not certified, or is certified by someone that is not an agent of the Contractor; or
- C. A non-conforming record remains uncorrected for one payroll period after Owner or its designee has given Contractor notice of inaccuracies detected by Owner or its designee.

NAME AND ADDRESS OF BONDING COMPANY

Contractor shall provide Owner with the name and address of any bonding company issuing a bond that secures the payment of wages by the Contractor. If the name or address of any such bonding company changes over the term of this Contract, Contractor shall provide the new name and/or address of the bonding company to Owner in writing within ten days of such change. The writing shall be clearly identified as "Notice of Change in Bonding Company for

Payment of Wages.”

The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall provide Owner with the name and address of any bonding company issuing a bond that secures the payment of wages by the Subcontractor. If the name or address of any such bonding company changes over the term of the Project, Subcontractor shall provide the new name and/or address of the bonding company to Owner in writing within ten days of such change. The writing shall be clearly identified as “Notice of Change in Bonding Company for Payment of Wages.”

NOTICE TO BONDING COMPANY

Contractor acknowledges and agrees that in the event that Owner or its Compliance Administrator or any other Owner representative, provides notice of withholding contract payment to the Contractor or Subcontractor, a copy of the notice may also be served on any of Contractor’s or Subcontractor’s bonding companies that issued a bond to securing payment of wages.

The Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, a provision that each Subcontractor shall acknowledge and agrees that in the event that Owner or its Compliance Administrator or any other Owner representative, provides notice of withholding contract payment to the Contractor or Subcontractor, a copy of the notice may also be served on any of Contractor’s or Subcontractor’s bonding companies that issued a bond to securing payment of wages.

NOTICE OF WITHHOLDING

Owner shall provide Contractor with notice of withholding contract payments.

Owner shall provide Contractor and Subcontractor with notice of withholding if withholding is due to Subcontractor.

REQUEST FOR REVIEW

The exclusive and only means for Contractor or Subcontractor to receive review of a decision by Owner to withhold payment for violations of the prevailing wage requirements is through the procedure set forth herein.

Contractor or Subcontractor may contest a finding that it has violated the prevailing wage

requirement laws by submitted a writing clearly identified as “Request for Review” to Owner’s Labor Compliance Program personnel as identified in Paragraph 2 of this Document within sixty (60) days after service of the Notice to Withhold of Contract Payments.

The Request for Review must clearly identify the Notice of Withholding Contract Payments from which review is sought, including the date of the Notice of Withholding Contract Payments or it shall include a copy of the Notice of Withholding Contract Payments as an attachment.

The Request for Review must contain a complete statement of the basis for the protest.

The Request for Review must refer to the specific portion of the Notice to Withhold that forms the basis for the protest.

The Request for Review must include the name, address, and telephone number of the person representing the protesting party.

Contractor shall insert in every subcontract or other arrangement which Contractor may make for performance of Work or labor on Work provided for in the Contract, the same terms as set forth in this Document 00 7300 Paragraphs 15, 16 and 17 and each subpart thereto.

Failure to Request Review Shall Result in Final Judgment

Failure by the Contractor to submit a timely Request for Review may result in a final order which shall be binding on the Contractor, and which shall also be binding, with respect to the amount due, on the bonding company issuing a bond that secures the payment of wages by the Contractor and a surety on the bond.

Failure by the Subcontractor to submit a timely Request for Review may result in a final order which shall be binding on the Subcontractor, and which shall also be binding, with respect to the amount due, on the bonding company issuing a bond that secures the payment of wages by the Subcontractor and a surety on the bond.

No Interim Payment of Withheld Contract Payments

Pending a final order, or the expiration of the time period for seeking review of the Notice of Withholding of Contract Payments, Owner shall not disburse any Contract payments that have been withheld.

Failure to Comply with Labor Laws May Result in Penalties

Failure by Contractor or Subcontractor to pay every employee performing Work prevailing wages may result in the Contractor and/or Subcontractor being prohibited from bidding on

public works projects for up to three years.

Failure by Contractor or Subcontractor to pay every employee performing Work prevailing wages may result in the Contractor and/or Subcontractor being prohibited from being awarded public works projects for up to three years.

Failure by Contractor or Subcontractor to pay every employee performing Work prevailing wages may result in a forfeiture of the unpaid wages by the Contractor or Subcontractor.

Failure by Contractor or Subcontractor to pay every employee performing Work prevailing wages may result in a forfeiture of up to \$50.00 per each calendar day, or portion thereof, for each worker paid less than the prevailing wage rates.

Failure by Contractor or Subcontractor to submit certified copies of payroll records within ten days of a written request from Owner, the Compliance Administrator or any other Owner representative may result in a forfeiture of up to \$25.00 per each calendar day, or portion thereof, for each worker until strict compliance is effectuated.

Failure by Subcontractor to pay every employee performing Work prevailing wages may result in withholdings, penalties and forfeitures being assessed against Contractor.

CONTRACTOR MUST MONITOR SUBCONTRACTOR COMPLIANCE

Contractor shall monitor the payment of the specified general prevailing rate of per diem wages to employees by each Subcontractor by periodically reviewing the certified payroll records of each Subcontractor.

Corrective Action by Contractor Regarding Subcontractor

Once the Contractor is aware that any Subcontractor has failed to pay its workers the specified prevailing rate of wages, the Contractor shall diligently take corrective action to halt or rectify the failure, including but not limited to, retaining sufficient funds due to the Subcontractor for Work performed on the Project.

AFFIDAVIT PRIOR TO FINAL PAYMENT TO SUBCONTRACTOR

Prior to making final payment to any Subcontractor for Work performed on the Project, Contractor shall obtain an affidavit signed under penalty of perjury from each Subcontractor that each Subcontractor has paid the specified general prevailing rate of per diem wages to its employees on the Project and any amounts due under California Labor Code §1813.

NOTICE OF PRIOR VIOLATIONS OF THE PREVAILING WAGE RATES

Contractor shall promptly notify Owner if Contractor has been barred from bidding for or working on public works projects for any reason.

Contractor shall promptly notify Owner if Contractor or a firm, corporation, partnership, or association in which the Contractor has any interest has been found to have willfully violated the prevailing wage rate laws.

Contractor shall promptly notify Owner if Contractor or a firm, corporation, partnership, or association in which the Contractor or has any interest has been found to have violated the public works chapter of the California Labor Code with an intent to defraud.

The term “any interest” shall have the meaning set forth in California Labor Code §1777.1(f) or any amendment thereto.

Notice shall be given by the Contractor to Owner before bidding closes or if Contractor is unaware until after bidding has closed, before the Contract is awarded or if the Contractor is unaware until after the Contract has been awarded then before it is executed and if the Contractor is unaware until after the Contract has been executed then not more than five calendar days after Contractor has notice of any kind that it has been found to have willfully violated the prevailing wage rate laws or found to have violated the public works chapter of the California Labor Code with an intent to defraud.

APPRENTICES

Contractor and Subcontractors shall comply with the requirements of California Labor Code §§1776, 1777.5, and 1777.6 concerning the employment of apprentices by Contractor or Subcontractors.

Willful failure to comply may result in penalties, including loss of the right to Bid on or receive public works contracts. The requirements of Labor Code §1777.5 do not apply to contracts of general contractors or to contracts of specialty contractors not bidding for work through a general or prime contractor when the contracts of general contractors or those specialty contractors involve less than thirty thousand dollars (\$30,000).

CERTIFICATION OF APPROVAL

California Labor Code §1777.5, as amended, requires a Contractor or Subcontractor employing tradespersons in any apprenticeable occupation to apply to the joint apprenticeship committee nearest the site of a public works project and which administers the apprenticeship program in that trade for a certification of approval. The certificate shall also fix the ratio of apprentices to

journeypersons that will be used in performance of the Contract. The ratio of work performed by apprentices to journeypersons in such cases shall not be less than one hour of apprentice's work for every five hours of labor performed by journeypersons (the minimum ratio for the land surveyor classification shall not be less than one apprentice for each five journeypersons), except:

- A. When unemployment for the previous three-month period in the area exceeds an average of 15 percent;
- B. When the number of apprentices in training in the area exceeds a ratio of one to five;
- C. When a trade can show that it is replacing at least 1/30 of its membership through apprenticeship training on an annual basis statewide or locally; or
- D. Assignment of an apprentice to any work performed under a public works contract would create a condition which would jeopardize his or her life or the life, safety, or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyperson.

FUND CONTRIBUTIONS

If Contractor or any Subcontractor employs journeymen or apprentices in any apprenticeable craft to perform any of the Work under the Contract, they shall make apprenticeship training contributions, to the California Apprenticeship Council, in an amount determined by the Director of the Department of Industrial Relations, or as otherwise required by law.

APPRENTICESHIP STANDARDS

Information relative to apprenticeship standards, wage schedules, and other requirements may be obtained from the Director of the California Department of Industrial Relations, or from the Division of Apprenticeship Standards and its branch offices.

EIGHT HOUR DAY LIMITATION

In accordance with the provisions of Division 2, Part 7, Chapter 1, Article 3 of the Labor Code, State of California, and in particular Sections 1810 to 1815 inclusive, thereof, eight (8) hours labor shall constitute a days' work and no laborer, worker, or mechanic in the employ of said Contractor, or any subcontractor doing or contracting to do any part of the Work contemplated by this Contract, shall be required or permitted to work more than eight (8) hours in any one calendar day, and forty (40) hours in any one calendar week unless compensated at not less

than time and a half as set forth in California Labor Code Section 1815. However, if the prevailing wage determination requires a higher rate of pay for overtime than is required under said Section 1815, then the overtime rate must be paid, as specified in California Code of Regulation Title 8, Group 3, Section 16200(a)(3)(F). The Contractor and each subcontractor shall also keep an accurate record showing the names and actual hours worked of all workers employed by them in connection with the work contemplated by this Contract, which record shall be open at all reasonable hours for the inspection of the District or its officers or agents and by the Division of Labor Standards Enforcement of the Department of Industrial Relations, their deputies or agents; and it is hereby further agreed that said Contractor shall forfeit as a penalty to the District, the sum of Twenty-Five and No/100 Dollars (\$25.00) for each laborer, worker or mechanic employed in the execution of this Contract by the Contractor or by any subcontractor for each calendar day during which such laborer, worker or mechanic is required or permitted to labor more than eight (8) hours in any one calendar day and forty (40) hours in one calendar week in violation of these provisions.

LABOR DISCRIMINATION

Attention is directed to Section 1735 of the Labor Code, which reads as follows:

"A contractor shall not discriminate in the employment of persons upon public works on any basis listed in subdivision (a) of Section 12940 of the Government Code, as those bases are defined in Sections 12926 and 12926.1 of the Government Code, except as otherwise provided in Section 12940 of the Government Code. Every contractor for public works who violates this section is subject to all the penalties imposed for a violation of this chapter."

END OF DOCUMENT

5-C INSURANCE AND INDEMNIFICATION**PAYMENT, PERFORMANCE AND MAINTENANCE BONDS**

The Contractor shall within ten (10) days after notice of award of the Contract, furnish surety bonds (Payment Bond, Performance Bond, and Maintenance Bond) executed by a surety authorized to conduct business in California using the bond forms approved by the Owner. The payment bond shall be in the amount equal to one hundred percent (100%) of the Contract Amount and shall be for payment of claims for materials, equipment, labor, and subcontractors employed by the Contractor thereon. The faithful performance bond shall be in an amount equal to one hundred percent (100%) of the Contract Amount and shall be for the faithful performance of the Contract, and for the fulfillment of such other requirements as may be provided by law. The performance bond shall remain in effect or a maintenance bond in the amount of 10% of the contract amount shall be provided to guarantee the repair and replacement of defective equipment, materials, and workmanship, and payment of damages sustained by the Owner on account of such defects, discovered within two (2) years after the date of final payment. The surety company shall waive the right of special notification of any change or modification of this Contract or of extension of time, or of decreased or increased Work, or of the cancellation of the Contract, or of any other act or acts by the Owner or its authorized agents under the terms of this Contract; and failure to so notify the surety of changes shall not relieve the surety of its obligations under this Contract.

INSURANCE

Within ten (10) days after the Award of Contract, the Contractor shall promptly obtain, at its own expense, all the insurance required by this section. The Contractor shall not allow any subcontractor to commence work on its subcontract until all similar insurance required of the subcontractor, except Builder's Risk Insurance, has been obtained and verified by the Contractor.

Contractor and all sub contractors will provide to the District a Certificate of Insurance (Col) naming the State of California, Department of Water Resources as an additionally insured Certificate Holder. The Col must include: State of California, Department of Water Resources, its officers, agents, employees, as required by written contract or permit. The State of California Department of Water Resources address to be used on the Col is the following:

State of California DWR
P.O. Box 942836
Sacramento, CA 95899-7405

Companies writing the insurance under this article shall be licensed to do business in the State

of California except as otherwise approved by the District. Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A-VII.

Contractor shall include all costs for insurance in its bids. Nothing contained in these insurance requirements is to be construed as limiting the extent of the Contractor's responsibility for payment of damages resulting from its operations under this Contract. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the District, the Design Consultant and the District's Representative, and their officers, officials, employees, agents, and volunteers. Any insurance or self-insurance maintained by the District, its officers, officials, employees, agents or volunteers shall be in excess of the Contractor's insurance and shall not contribute with it.

Within ten (10) days after award of the Contract, Contractor shall furnish to Scotts Valley Water District ("Owner") satisfactory proof that Contractor has taken out for the entire period covered by the Contract the following classes of insurance in the form and with limits and deductibles specified below, unless otherwise specified in Contract Documents.

- A. Comprehensive General Liability Insurance covering claims for personal injury, bodily injury and property damage arising out of the Work and in a form providing coverage not less than that of a Standard Commercial General Liability Insurance policy ("Occurrence Form"). Such insurance shall provide for all operations and include independent contractors, products liability, and completed operations for one year after Final Completion and acceptance of the final payment for the Work, contractual liability, and coverage for explosion, collapse, and underground hazards. The limits of such insurance shall not be coverage of less than [\$2,000,000] each occurrence, [\$3,000,000] general aggregate limit, and [\$3,000,000] aggregate for products and completed operations. The policies shall be endorsed to provide Broad Form Property Damage Coverage.
- B. Comprehensive Automobile Liability Insurance covering all owned, non-owned, and hired vehicles. Such insurance shall provide coverage not less than the standard Comprehensive Automobile Liability policy with limits not less than [\$1,000,000] each person Bodily Injury, [\$1,000,000] each occurrence Bodily Injury, and [\$1,000,000] each occurrence Property Damage.
- C. All-Risk Course of Construction Insurance including damage to property owned by Owner, Contractor or third parties caused by fire. Insurance shall be in the amount of 100 percent of the completed value of the Work to be performed under this Contract. Deductible shall not exceed [\$10,000.00]. Each loss shall be borne by Contractor.

- D. Workers' Compensation Insurance for all persons whom the Contractor may employ in carrying out Work contemplated under Contract Documents, in accordance with the Act of Legislature of State of California, known as "Workers' Compensation Insurance and Safety Act," approved May 26, 1913, and all acts amendatory or supplemental thereto, in the statutory amount.
- E. Contractor and all sub contractors will provide to the District a Certificate of Insurance (Col) naming the State of California, Department of Water Resources as an additionally insured Certificate Holder. The Col must include: State of California, Department of Water Resources, its officers, agents, employees, as required by written contract or permit. The State of California Department of Water Resources address to be used on the Col is the following:

State of California DWR
P.O. Box 942836
Sacramento, CA 95899-7405

INSURANCE REQUIREMENTS

Insurance Company Ratings

All policies of insurance shall be placed with insurers acceptable to Owner. The insurance underwriter(s) for all insurance policies except Workers' Compensation shall have an A. M. Best Company rating of **A- VIII** or better, unless otherwise specified in the Contract Documents. Required minimum amounts of insurance may be increased should conditions of Work, in opinion of Owner, warrant such increase. Contractor shall increase required insurance amounts upon direction by Owner.

Required Endorsements

The policies required under this Document shall be endorsed as follows: Name the Owner, its elected and/or appointed governing body and boards, employees, representatives, consultants, and agents, and Project Manager as additional insureds, but only with respect to liability arising out of the activities of the named insured.

Separate Application

Each such policy shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limit of the insurance company's liability required hereunder. Should any of the policies identified herein contain a "cross-suits" exclusion, such exclusion must not apply to any additional insureds.

Contractor's Insurance is Primary

Contractor's Insurance shall be primary and no other insurance or self-insured retention carried or held by Owner shall be called upon to contribute to a loss covered by insurance for the named insured.

Proof of Coverage

Before the Notice to Proceed with the Work under this Contract is issued, the Contractor shall furnish the Owner with certificate(s) evidencing issuance of all insurance mentioned herein, copies of the policy declaration or information page(s) and additional insured endorsements. The certificate(s) and endorsements for each insurance policy are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements are to be on the forms approved by the District. The certificate(s), policy declaration or information page(s), and endorsements are to be received and approved by the Owner before work commences. Contractor shall also provide certificate(s) evidencing renewals of all insurance required herein, at least thirty (30) days prior to the expiration date of any such insurance.

Evidence of Insurance

Certificates of insurance and endorsements shall have clearly typed thereon Owner information and the name of the Project.

Deductibles

Any deductibles or self-insured retentions must be declared to and approved by the District. At the option of the District, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions or procure a bond in a form satisfactory to the District guaranteeing payment of losses and related investigations, claim administration and defense expenses.

Notice of Cancellation or Non-Renewal

Written notice of cancellation, non-renewal, or reduction in coverage of any policy shall be mailed to Owner, 60 Days in advance of the effective date of the cancellation, non-renewal, or reduction in coverage. Written notice of cancellation for non-payment shall be mailed within 10 Days of cancellation.

Continuous Coverage

Contractor shall maintain insurance in full force and effect during the entire period of performance of the Work. Contractor shall keep insurance in force during warranty and guarantee periods, except that Contractor may discontinue All-Risk Course of Construction Insurance after Final Payment. At the time of making application for extension of time, and during all periods exceeding the Contract Time resulting from any cause, Contractor shall submit evidence that insurance policies will be in effect during the requested additional period

of time. Upon Owner's request, Contractor shall submit to Owner, within 10 Days, copies of the actual insurance policies or renewals or replacements.

Waiver of Subrogation

Evidence of coverage shall be accompanied by an endorsement from the insurer agreeing to waive all rights of subrogation against the District, its officers, officials, employees, agents or volunteers; the Design Consultant, the Construction Manager and each of their partners, officers, officials, employees, agents and volunteers which might arise by reason of any payment under the policy in connection with the Work performed by Contractor.

Requirement to Maintain Insurance

Contractor shall pay all insurance premiums, including any charges for required waivers of subrogation or the endorsement of additional insureds.

Workers Compensation

If injury occurs to any employee of Contractor, Subcontractor or sub-subcontractor for which the employee, or the employee's dependents in the event of employee's death, is entitled to compensation from Owner under provisions of the Workers' Compensation Insurance and Safety Act, as amended, or for which compensation is claimed from Owner, Owner may retain out of sums due Contractor under Contract Documents, amount sufficient to cover such compensation, as fixed by the Act, as amended, until such compensation is paid, or until it is determined that no compensation is due. If Owner is compelled to pay compensation, Owner may, in its discretion, either deduct and retain from the Contract Sum the amount so paid, or require Contractor to reimburse Owner.

No Limitation

Nothing herein shall be construed as limiting in any way the extent to which Contractor or any Subcontractor may be held responsible for payment of damages resulting from their operations.

Subcontractor's Insurance

All Subcontractors shall maintain the same insurance required to be maintained by Contractor with respect to their portions of the Work unless otherwise indicated in Contract Documents, and Contractor shall cause the Subcontractors to furnish proof thereof to Owner within ten Days of Owner's request.

Failure to Obtain and Maintain Insurance

In the event of the breach of any provision of this paragraph, or in the event of any notices received which indicates any required insurance coverage will be diminished or canceled,

Owner, at its option, may, notwithstanding any other provisions of this Agreement to the contrary, immediately declare a material breach of this Agreement and suspend all further work pursuant to this Agreement. If Contractor fails to maintain insurance, Owner may (but is not required to do so) take out comparable insurance, and deduct and retain the amount of premium from any sums due Contractor under Contract Documents.

INDEMNIFICATION

Contractor shall indemnify, defend with counsel acceptable to Owner and hold harmless to the full extent permitted by law, Owner, the Design Consultant and the Construction Manager, their consultants, sub consultants, and their officers, officials, employees, agents and volunteers, (collectively “the Indemnified Parties”), from and against any and all liability, loss, damage, claims, expenses and costs (including, without limitation, attorney fees and costs and fees of litigation) (collectively, “Liability”) of every nature arising out of or in connection with Contractor’s performance of the Work or its failure to comply with any of its obligations contained in this Agreement. Such obligation shall not be construed to negate, abridge, or otherwise reduce any other right or obligation of indemnity which would otherwise exist. Such indemnification by the Contractor shall include, but not be limited to, the following:

- A. Liability or claims resulting directly or indirectly from the negligence or carelessness of the Contractor, its subcontractors, employees, or agents in the performance of the Work, or in guarding or maintaining the same, or from any improper materials, implements, or appliances used in its construction, or by or on account of any act or omission of the Contractor, its employees, or agents.
- B. Liability or claims arising directly or indirectly from bodily injury, occupational sickness or disease, or death of the Contractor’s, or Supplier’s own employees, or agents engaged in the Work resulting in actions brought against the Indemnified Parties;
- C. Liability or claims arising directly or indirectly from or based on the violation of any Laws or Regulations, whether by the Contractor, its subcontractors, employees, or agents.
- D. Liability or claims arising directly or indirectly from the use or manufacture by the Contractor, its subcontractors, employees, or agents in the performance of this Agreement of any copyrighted or non-copyrighted composition, secret process, patented or unpatented invention, article, or appliance, unless otherwise specified stipulated in this Agreement.
- E. Liability or claims arising directly or indirectly from the breach of any warranties, whether express or implied, made to the Owner or any other parties by the Contractor,

its subcontractors, employees, or agents;

- F. Liability or claims arising directly or indirectly from the willful misconduct of the Contractor, its subcontractors, employees, or agents.
- G. Liability or claims arising directly or indirectly from any breach of the obligations assumed in this Agreement by the Contractor.
- H. Liability or claims arising directly or indirectly from, relating to, or resulting from a hazardous condition created by the Contractor, Subcontractors, Suppliers, or any of their employees or agents, and;
- I. Liability or claims arising directly, or indirectly, or consequentially out of any action, legal or equitable, brought against the Indemnified Parties, their consultants, sub-consultants, and the officers, directors, employees, agents and volunteers of each or any of them, to the extent caused by the Contractor's use of any premises acquired by permits, rights of way, or easements, the Site, or any land or area contiguous hereto or its performance of the Work thereon.

Liability arising directly or indirectly from exposure to hazards in violation of the California Labor Code that may be asserted by any person or entity, including, but not limited to, the Contractor, arising out of or in connection with the negligent activities of the Contractor, its agents, employees or privities pursuant to this Contract, whether or not there is concurrent negligence on the part of the Indemnified Parties.

The Contractor shall reimburse the Indemnified Parties for all costs and expenses, (including but not limited to fees and charges of engineers, architects, attorneys, and other professionals and court costs of appeal) incurred by said Indemnified Parties in enforcing the provisions of this Paragraph.

The indemnification obligation under this Section shall not be limited in any way by any limitation on the amount or type of insurance carried by Contractor or by the amount or type of damages, compensation, or benefits payable by or for the Contractor or any Subcontractor or other person or organization under workers' compensation acts, disability benefit acts, or other employee benefit acts.

Pursuant to California Public Contract Code Section 9201, Owner shall timely notify Contractor of receipt of any third-party claim relating to this Agreement.

The Contractor's obligations pursuant to this provision will survive the expiration or earlier termination of this Contract.

The Contractor's duty to indemnify and save harmless shall include the duty to defend as set forth in California Civil Code Section 2778; provided, that nothing herein contained shall be construed to require Contractor to indemnify the Indemnified Party against any responsibility or liability in contravention of California Civil Code Section 2782. The duty to defend and indemnify hereunder is not limited by the insurance coverage required under the Contract Documents and is separate and apart from such coverage.

The Contractor shall furnish the District with a copy of the Employer's Report of Injury immediately following any incident requiring the listing of said report on the OSHA Log during the prosecution of the work under this Contract. The Contractor shall also furnish the Construction Manager with a copy of the Employer's Report of injury involving any subcontractor on this project.

The Contractor shall advise all insurance companies to familiarize themselves with all of the Conditions and provisions of this Contract, and they shall waive the right of special notification of any change or modification of this Contract or of extension of time, or of decreased or increased work, or of the cancellation of the Contract, or of any other act or acts by the Indemnified Parties, under the terms of this Contract, and failure to so notify the aforesaid insurance companies of changes shall in no way relieve the insurance companies of their obligation under this Contract.

For all work the Contractor or its subcontractors perform during the guarantee period, worker's compensation, and commercial general liability insurance and insurance in the amounts and format required herein, shall remain in force and be maintained for five (5) years after final completion.

END OF DOCUMENT

SECTION 6 CONTRACT ADMINISTRATION

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6-A PRE-AWARD SUBSTITUTION

Not Applicable to this Contract.

END OF DOCUMENT

6-B INFORMATION AND PROCEDURES INSTRUCTIONS**GENERAL**

This Section contains the procedures to be followed by the Contractor upon discovery of any apparent conflicts, omissions, or errors in the Contract Documents or upon having any question concerning interpretation.

NOTIFICATION BY CONTRACTOR

Submit all requests for clarification or additional information in writing to the Owner's Representative using a Request for Information (RFI) form as acceptable to the Owner's Representative.

Request for Information

Number RFIs sequentially. Follow RFI number with sequential alphabetical suffix as necessary for each resubmission. For example, the first RFI would be "001." the second RFI would be "002." The first resubmittal of RFI "002" would be "002a."

Limit each RFI to one (1) subject.

Submit a RFI if one of the following conditions occur:

- A. The Contractor discovers an unforeseen condition or circumstance that is not described in the Contract Documents.
- B. The Contractor discovers an apparent conflict or discrepancy between portions of the Contract Documents that appears to be inconsistent or cannot be reasonably inferred from the intent of the Contract Documents.
- C. The Contractor discovers what appears to be an omission from the Contract Documents that cannot be reasonably inferred from the intent of the Contract Documents.

RFIs will not be recognized or accepted if, in the opinion of the Owner's Representative, one of the following conditions exists:

- A. The Contractor submits the RFI as a request for substitution.
- B. The Contractor submits the RFI as a submittal.
- C. The Contractor submits the RFI under the pretense of a Contract Documents discrepancy or omission without thorough review of the Contract Documents.

- D. The Contractor submits the RFI in a manner that suggest that specific portions of the Contract Documents are assumed to be excluded or by taking an isolated portion of the Contract Documents in part rather than whole.
- E. The Contractor submits an RFI in an untimely manner without proper coordination and scheduling of Work of related trades.
- F. Ask for any clarification or request for information immediately upon discovery. Submit RFIs in a reasonable time frame so as not to affect the Contract Schedule while allowing the full response time described below.

RESPONSE TIME

The Owner's Representative, whose decision will be final and conclusive, shall resolve such questions and issue instructions to the Contractor within a reasonable time frame. In most cases, RFIs will receive a response within 10 working days. In some cases, this time may need to be lengthened for complex issues, or shortened for emergency situations, as mutually agreed in writing.

Should the Contractor proceed with the Work affected before receipt of a response from the Owner's Representative, within the response time described above, any portion of the Work which is not done in accordance with the Owner's Representative's interpretations, clarifications, instructions, or decisions is subject to removal or replacement and the Contractor shall be responsible for all resultant losses.

END OF DOCUMENT

6-C MODIFICATION PROCEDURES**GENERAL**

Procedures for modifying the Contract Documents and determining costs for changes in contract amounts.

CONTRACTOR INITIATED CHANGE ORDER REQUEST (COR) PROCEDURES

Contractor may initiate changes by submitting a 7-D Change Order Request Form (COR).

Whenever Contractor elects or is entitled to submit a COR, Contractor shall prepare and submit to Owner for consideration a COR using the form included in these Contract Documents. All CORs must contain a complete breakdown of costs of credits, deducts and extras; itemizing materials, labor, taxes, Markup and any requested changes to Contract Time. All Subcontractor Work shall be so indicated. Individual entries on the COR form shall include applicable Schedule of Values code, with all amounts determined as provided herein. After receipt of a COR with a detailed breakdown, Owner will act promptly thereon.

If Owner accepts a COR, Owner will prepare a Change Order for Owner and Contractor signatures.

If COR is not acceptable to Owner because it does not agree with Contractor's proposed cost and/or time, Owner will provide comments thereto. Contractor will then, within seven (7) Days (except as otherwise provided herein), submit a revised COR.

When necessity to proceed with a change does not allow Owner sufficient time to conduct a proper check of a COR (or revised COR), Owner may issue a Change Directive (CD) as provided below.

CONTRACTOR-INITIATED REQUEST FOR INFORMATION (RFI) PROCEDURES, REQUIREMENTS AND LIMITATIONS

Contractor may submit RFI's for clarifications in Owner-prepared Contract Documents, which may result in the Contractor submitting a COR.

Whenever Contractor requires information regarding the Project or Owner-prepared Contract Documents, or receives a request for such information from a Subcontractor, Contractor may prepare and deliver an RFI to Owner. Contractor shall use RFI format provided on approval by Owner. Contractor shall not issue an RFI to Owner solely to clarify Contractor-prepared Construction Documents. Contractor must submit time critical RFIs at least 30 Days before

scheduled start date of the affected Work activity. Contractor shall reference each RFI to an activity of Progress Schedule and shall note time criticality of the RFI, indicating time within which a response is required. Contractor's failure to reference RFI to an activity on the Progress Schedule and note time criticality on the RFI shall constitute Contractor's waiver of any claim for time delay or interruption to the Work resulting from any delay in responding to the RFI.

Contractor shall be responsible for its costs to implement and administer RFIs throughout the Contract duration. Regardless of the number of RFIs submitted, Contractor shall not be entitled to additional compensation for the effort required to submit the RFIs. Contractor shall be responsible for Owner's administrative costs for answering RFIs where the answer could reasonably be found by reviewing the Contract Documents, as determined by Owner; at Owner discretion, such costs may be deducted from progress payments or final payment.

Owner will respond within fourteen (14) Days from receipt of RFI with a written response to Contractor. Contractor shall distribute response to all appropriate Subcontractors.

If Contractor is satisfied with the response and does not request a change in Contract Sum or Contract Time, then the response shall be executed without a change.

If Contractor believes the response is incomplete, Contractor shall issue another RFI (with the same RFI number with the letter "A" indicating it is a follow-up RFI) to Owner clarifying original RFI. Additionally, Owner may return RFI requesting additional information should original RFI be inadequate in describing condition.

TIME REQUIREMENTS

If Contractor believes that an Owner response to an RFI, submittal or other Owner direction, results in change in Contract Sum or Contract Time, Contractor shall notify Owner with the issuance of a preliminary COR within seven Days after receiving Owner's response or direction, and in no event after starting the disputed work or later than the time allowed the General Conditions). If Contractor also requests a time extension, or has issued a notice of delay or otherwise requests a time extension with a COR, then Contractor shall submit the TIE required herein concurrently with the COR.

If Contractor requires more time to accurately identify the required changes to the Contract Sum or Contract Time, Contractor may submit an updated and final COR and TIE within 14 days of submitting the preliminary COR.

If Owner agrees with Contractor, then Contractor must submit a COR within fourteen (14) Days of receiving the response to the RFI and COR. If Owner disagrees with Contractor, then Contractor may give notice of potential claim and proceed thereunder.

Contractor must submit CORs, CP's, notices of potential claim or Claims within the required time periods. Any failure to do so waives Contractor's right to submit a COR, CP or file a Claim.

COST ESTIMATE INFORMATION

Contractor and subcontractors shall, upon Owner's request, permit inspection of the original unaltered cost estimates, subcontract agreements, purchase orders relating to the change, and documents substantiating all costs associated with its COR or Claims arising from changes in the Work.

PROCEDURES FOR OWNER INITIATED CHANGE DIRECTIVES (CD) CHANGE ORDERS (CO) OR REQUEST FOR QUOTATION (RFQ)

Owner Initiated Change Directives (CD)

Owner may, by Change Directive ("CD") or initially by Supplemental Instruction or by following the procedures for disputed work herein, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, with or without adjustment to Contract Sum or Contract Time.

If at any time, Owner believes in good faith that a timely Change Order will not be agreed upon using the foregoing procedures, or at any other time, Owner may issue a CD with its recommended cost and/or time adjustment (if any). Upon receipt of CD, Contractor shall promptly proceed with the change of work involved and respond to Owner within ten (10) Days.

Contractor's response must be any one of following:

- A. Return CD signed, thereby accepting Owner response, including adjustment to time and cost (if any).
- B. Submit a (revised if applicable) COR with supporting documentation (if applicable, reference original COR number followed by letter A, B, etc. for each revision), if Owner so requests.
- C. Give notice of intent to submit a claim and submit its claim as provided therein.

If COR or the CD provides for an adjustment to any Contract Sum, the adjustment shall be based on one of the following methods:

- A. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation.
- B. Contractor to proceed on cost reimbursable (force account) basis while negotiating towards a firm price.
- C. Cost to be determined in a manner agreed.

Change Directive signed by Contractor indicates the agreement of Contractor therewith, including adjustment in Contract Sum or the method for determining them. Such agreement shall be effective immediately and shall be finalized as a Change Order. Where Owner authorizes CD work on a time and materials basis up to a maximum amount, then Contractor shall promptly advise Owner upon reaching 75% of such maximum amount, otherwise Contractor shall accept fully the risk of completing the CD work without exceeding such maximum amount.

If Contractor does not respond promptly or disagrees with the method for adjustment (or non-adjustment) in the Contract Sum, the method and the adjustment shall be determined by Owner on the basis of the Contract Documents and the reasonable expenditures and savings of those performing the Work attributable to the change. If the parties still do not agree on the proper adjustment due to a Change Directive, Contractor may file a claim and/or Owner may direct the changed work through a unilateral change order. Contractor shall keep and present an itemized accounting in a manner consistent with the Schedule of Values (SOV), together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this paragraph shall be limited to those provided herein.

Pending final determination of cost to Owner, Contractor may include amounts not in dispute in its Applications for Payment. The amount of credit to be allowed by Contractor to Owner for a deletion or change which results in a net decrease in the Contract Sum shall be actual net cost as confirmed by Owner. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for Markup shall be figured on the basis of net increase, if any, with respect to that change.

Owner Initiated Change Order (CO) or Request for Quotation (RFQ):

Owner may initiate changes in the Work or Contract Time by issuing a Request for Quotation ("RFQ") or Change Order ("CO") to Contractor.

Owner may issue an RFQ to Contractor. Any RFQ will detail all proposed changes in the Work and request a quotation of changes in Contract Sum and Contract Time from Contractor.

In response to an RFQ, Contractor shall furnish a COR within twenty-one (21) Days of Owner's RFQ. Upon approval of COR, Owner may issue a Change Directive directing Contractor to proceed with extra Work.

If the parties agree on price and time for the work, the Owner will issue a Contract Change Order. If the parties do not agree on the price or time for a CP, Owner may either issue a CD or decide the issue per the claim process. Contractor shall perform the changed Work notwithstanding any claims or disagreements of any nature.

Supplemental Instruction

Owner may issue Supplemental Instruction to Contractor.

If Contractor is satisfied with Supplemental Instruction and does not request change in Contract Sum or Contract Time, then Supplemental Instruction shall be executed without a Change Order.

If Contractor believes that Supplemental Instruction results in change in Contract Sum or Contract Time, then Contractor must submit a COR with the appropriate Cost Proposal to Owner within fourteen (14) Days of receiving the Supplemental Instruction.

Procedures that Apply to Contractor- and Owner-Initiated Change Orders

Adjustment of Schedules to Reflect Change Orders or CDs:

- A. Contractor shall revise Schedule of Values and Application for Payment forms to record each authorized Change Order or CD as a separate line item and adjust the Contract Sum as shown thereon prior to the next monthly pay period.
- B. Contractor shall revise the Progress Schedules prior to the next monthly pay period, to reflect CO or CD.
- C. Contractor shall enter changes in Project Record Documents prior to the next monthly pay period.

Required Documentation for Adjustments to Contract Amounts

For all changes and cost adjustments requested, Contractor shall provide documentation of change in Contract Amounts asserted, with sufficient data to allow evaluation of the proposal.

On all requests for compensation, cost proposals, estimates, claims and any other calculation of costs made under the Contract Documents, Contractor shall breakout and quantify costs of labor, equipment and materials identified herein, for Contractor and subcontractors of any tier.

Contractor shall, on request, provide additional data to support computations for:

- A. Quantities of products, materials, labor and equipment.
- B. Taxes, insurance, and bonds.
- C. Justification for any change in Contract Time and new Progress Schedule showing revision due, if any.
- D. Credit for deletions from Contract, similarly documented.

Contractor shall support each claim or computation for additional cost, with additional information including:

- A. Origin and date of claim or request for additional compensation.
- B. Dates and times Work was performed and by whom.
- C. Time records and wage rates paid.
- D. Invoices and receipts for products, materials, equipment and subcontracts, similarly documented.
- E. Credit for deletions from Contract, similarly documented.

Responses and Disputes

For all responses for which the Contract Documents do not provide a specific time period, recipients shall respond within a reasonable time.

For all disputes arising from the procedures herein, Contractor shall follow the claims procedures.

COST DETERMINATION FOR CHANGES IN CONTRACT AMOUNTS

Calculation of Total Cost of Extra Work

Total cost of changed Work, extra Work or of Work omitted shall be the sum of three components defined immediately below as: Component A Direct Cost(s); Component B Markup; and, Component C Bonds, Insurance, Taxes.

Component A is Direct Cost(s) of labor, equipment and materials, is calculated based upon actually incurred (or omitted) labor costs, material costs and equipment rental costs, as defined herein;

Component B: Markup on such actually incurred Direct Costs, is applied in the percentages identified below; and

Component C is actual additional costs for any additionally required insurance, bonds, and/or taxes, defined herein, is calculated without Markup.

COMPONENT A: MEASUREMENT OF DIRECT COST OF CONSTRUCTION

Component A has four subcomponents, also referred to as “LEMS”:

Labor (Component 1)

Equipment (Component 2)

Materials (Component 3)

Subcontractors (Component 4)

Measurement of Cost of Labor (Component 1)

Cost of Labor shall be calculated as: Cost of labor for workers (including forepersons when authorized by Owner) used in actual and direct performance of the subject work, whether employer is Contractor, Subcontractor or other forces, in the sum of the following:

- A. Actual Wages: Actual wages paid shall include any employer payments to or on behalf of workers for health and welfare, pension, vacation, and similar purposes.
- B. Labor surcharge: Payments imposed by local, county, state, and federal laws and ordinances, and other payments made to, or on behalf of, workers, other than actual wages as defined, such as worker’s compensation insurance. Such labor surcharge shall not exceed generally accepted standards in the State for labor rates in effect on date upon which extra Work is accomplished.
- C. Cost of labor shall include no other costs, fees or charges.

Labor cost for operators of equipment owned and operated by Contractor or any Subcontractor, shall be no more than rates of such labor established by collective bargaining agreements for type of worker and location of Work, whether or not owner-operator (i.e., Contractor or Subcontractor) is actually covered by such an agreement.

Cost of labor shall be recorded and documented in certified payroll records, maintained in the form customary and/or required in the State, delivered to Owner weekly.

Measurement of Cost of Equipment (Component 2)

Cost of Equipment shall be calculated as: Cost of Equipment used in actual and direct performance of the subject work, whether by Contractor, Subcontractor or other forces. Cost of Equipment shall be calculated as herein described:

- A. For rented equipment, cost will be based on actual rental invoices, appropriate for the use and duration of the work. Equipment used on extra Work shall be of proper size and type. If, however, equipment of unwarranted size or type and cost is used, cost of use of equipment shall be calculated at rental rate for equipment of proper size and type, as determined by Owner.
- B. Equipment rental cost for Contractor or Subcontractor-owned equipment, shall be determined by reference to, and not in excess of, the generally accepted standards in the State for equipment rental rates in effect on date upon which extra Work is accomplished. If there is no applicable rate for an item of equipment, then payment shall be made for Contractor- or Subcontractor-owned equipment at rental rate listed in the most recent edition of the CalTrans Standard Schedules and Specifications, and absent a rental rate therein, then the Association of Equipment Distributors (AED) book.

In all cases, rental rates paid shall be deemed to cover cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Unless otherwise specified, manufacturer's ratings, and manufacturer-approved modifications, shall be used to classify equipment for determination of applicable rental rates. Individual pieces of equipment or tools not listed in said publication and having a replacement value of \$700 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefore as payment is included in payment for labor. Rental time will not be allowed while equipment is inoperative due to breakdowns.

For equipment on Site, rental time to be paid for equipment shall be time equipment is in operation on extra Work being performed or on standby as approved by Owner. The following shall be used in computing rental time of equipment:

- A. When hourly rates are listed, less than 30 minutes of operation shall be considered to be ½ hour of operation.
- B. When daily rates are listed, less than four hours of operation shall be considered to be ½ Day of operation.
- C. Rates shall correspond to actual rates paid by Contractor, i.e., if Contractor pays lower weekly or monthly rates, then same shall be charged to Owner.

For equipment that must be brought to Site to be used exclusively on extra Work, cost of transporting equipment to Site and its return to its original location shall be determined as follows:

- A. Owner will pay for costs of loading and unloading equipment.
- B. Cost of transporting equipment in low bed trailers shall not exceed hourly rates charged by established haulers.
- C. Cost of transporting equipment shall not exceed applicable minimum established rates of California Public Utilities Commission or appropriate State Dept. of Transportation.
- D. Owner will not make any payment for transporting and loading and unloading equipment if equipment is used on Work in any other way than upon extra Work.
- E. Rental period may begin at time equipment is unloaded at Site of extra Work and terminate at end of the performance of the extra Work or Day on which Owner directs Contractor to discontinue use of equipment, whichever first occurs. Excluding Saturdays, Sundays, and Owner legal holidays, unless equipment is used to perform extra Work on such Days, rental time to be paid per Day shall be four hours for zero hours of operation, six hours for four hours of operation and eight hours for eight hours of operation, time being prorated between these parameters. Hours to be paid for equipment that is operated less than eight hours due to breakdowns, shall not exceed eight less number of hours' equipment is inoperative due to breakdowns.

Employee vehicles are not part of Component 2, rather, are included within Component B (Markup).

Equipment costs shall include no other costs, fees or charges.

Measurement of Cost of Material (Component 3)

Cost of Material shall be calculated as herein described. Cost of such materials will be cost to purchaser (Contractor, Subcontractor or other forces) from supplier thereof, except as the following are applicable:

If cash or trade discount by actual supplier is offered or available to purchaser, it shall be credited to Owner notwithstanding fact that such discount may not have been taken.

For materials salvaged upon completion of Work, salvage value of materials shall be deducted from cost, less discounts, of materials.

If cost of a material is, in opinion of Owner, excessive, then cost of material shall be deemed to be lowest current wholesale price at which material is available in quantities concerned delivered to Site, less any discounts as provided in this Paragraph.

Material costs shall include no other costs, fees or charges.

Measurement of Cost of Subcontractors (Component 4)

Where reimbursed or calculated per the terms of the Contract Documents, change order or Change Directive, cost of Subcontractors shall be calculated as amounts earned by Subcontractors procured in compliance with the Contract Documents and approved by the Owner, provided such subcontractor earned amounts meet the following requirements:

Such amounts are earned under the terms of the Subcontracts and the Work complies with the terms of the Contract Documents;

Such amounts are properly requested, documented and permitted under the terms of the subcontract(s) and the Contract Documents;

Total cost to Owner of Direct Costs of Construction (labor, equipment, materials), Markup, and costs of bonds, insurance and taxes, conform to contract limitations (i.e., totals paid by Owner do not exceed the 20% Markup limitation.)

COMPONENT B: MEASUREMENT AND PAYMENT OF MARK UP

Markup on Direct Cost of labor and materials for extra Work shall be 15%. Markup on Direct Cost of equipment for extra Work shall be 15%.

When extra Work is performed by Subcontractors, regardless of the number of tiers, total Markup on "Component A" Direct Costs shall not exceed 20%. Contractor and its Subcontractors shall divide the 20% as they may agree.

Under no circumstances shall the total Markup on any extra Work exceed twenty (20) percent, stated as a percent of the Direct Cost of labor, equipment and materials. This limitation shall apply regardless of the actual number of subcontract tiers.

On proposals covering both increases and decreases in Contract Sum, Markup shall be allowed on the net increase only as determined above. When the net difference is a deletion, no percentage for Markup shall be allowed, but rather an appropriate percentage deduction shall be issued in the amount of the net difference.

Measurement and Payment of Component B Mark Up

Component B Mark Up provides complete compensation to Contractor for:

- A. All Contractor profit;
- B. All Contractor home-office overhead;
- C. All Contractor assumption of risk assigned to Contractor under the Contract Documents;

- D. Subject to the qualifications below regarding self-performed work, all General Conditions and General Requirements.

Profit Compensation for profit included within Component B (Mark Up), includes without limitation: Fees of all types, nature and description; and Profit and margins of all types, nature and description.

Home Office Expenses. Compensation for home office expenses included within Component B Mark Up, includes without limitation: Salaries and other compensation of any type of Contractor's personnel (management, administrative and clerical), and all direct and indirect operating, travel, payroll, safety, storage, quality control, maintenance and overhead costs of any nature whatsoever, incurred by Contractor at any location other than the Project specific site office, including without limitation, Contractor's principal or branch offices; insurance premiums other than those for Project specific insurance directed by the Owner in a change order; all hardware, software, supplies and support personnel necessary or convenient for Contractor's capture, documentation and maintenance of its costs and cost accounting data and cost accounting and control systems and work progress reporting.

Assumption of Risk. Compensation for Contractor's assumption of risk under the Contract Documents, included within Component B Mark Up, includes without limitation loss, cost, damage, expense or liability resulting directly or indirectly from any of the following causes ("unallowable costs"), for Contractor and subcontractors of any tier: noncompliance with the Contract Documents, fault or negligence, defective or non-conforming Work, by Contractor or any Subcontractor or Vendor of any tier or anyone directly or indirectly employed by any of them, or for whose acts or omissions any of them are responsible or liable at law or under the Contract Documents; cost overruns of any type; costs in excess of any lump sum, not to exceed amount or GMP; costs resulting from bid or "buy out" errors, unallocated scope, or incomplete transfer of scope or contract terms to subcontractors; any costs incurred by Contractor relating to a Change in the Work without a Change Order or Change Directive in accordance with the Contract Documents; costs for work or materials for which no price is fixed in the Contract Documents, unless it is expressly specified that such work or material is to be paid for as extra work.

General Conditions and Division 1 General Requirements. Compensation for Contractor's General Conditions and General Requirements Costs included within Component B Mark Up, includes compensation to Contractor for: Contractor's direct costs, without overhead or profit, for salaries and related forms of compensation and employer's costs for labor and personnel costs, of Contractor's employees and sub-consultant's employees (if any), while and only to the extent they are performing Work at the Project Site. Personnel and Work compensated by this

Component include without limitation: All required Project management responsibilities; all on-site services; monthly reporting and scheduling; routine field inspection of Work; general superintendence; general administration and preparation of cost proposals, schedule analysis, change orders and other supporting documentation as necessary; salaries of project superintendent, project engineers, project managers, safety manager, other manager, timekeeper, and secretaries; all cost estimates and updates thereto; development, validation and updates to the project schedule; surveying; estimating. Compensation for Contractor's General Requirements Costs included within Component B Mark Up, compensates Contractor for its "General Requirements" Costs, including without limitation: all scheduling hardware, software, licenses, equipment, materials and supplies; purchase, lease or rental, build out, procurement, supporting equipment and maintenance of temporary on-Site facilities, Project field and office trailers and other temporary facilities, office equipment and supporting utilities; platforms, fencing, cleanup and jobsite security; temporary roads, parking areas, temporary security or safety fencing and barricades, etc.; all Contractor's motor vehicles used by any Contractor's personnel, and all costs thereof; all health and safety requirements, required by law or Owner procedures; all surveying; all protection of Work; handling and disposal fees; final cleanup; repair or maintenance; other incidental Work; all items, activities and function similar to any of those described above; all travel, entertainment, lodging, board and the like.

Personnel compensated by the Markup Component do not include workers of foreman level or below in the case of self-performed work; rather, such personnel shall be treated as a Direct Cost of Construction. Costs compensated by the Markup component do not include temporary measures specifically required by the changed work, not otherwise required or ongoing in the prosecution of the Work, that commences specifically to support the changed work and conclude with the completion of the changed work. Such costs shall be treated as Direct Costs of Construction. Examples of General Requirements costs that this component may not cover are the following: temporary barricades or fencing of specific areas required specifically for the changed work; cranes required specifically for the changed work; extra security required specifically for the changed work.

COMPONENT C: MEASUREMENT AND PAYMENT OF BONDS INSURANCE TAXES

Component C Bonds, Insurance, Taxes) consists of the cost of bonds, insurance and taxes, also referred to as "BIT". All State sales and use taxes, applicable County and applicable City sales taxes, shall be included. Federal and Excise tax shall not be included.

There is no mark up on BIT.

Bonds and Insurance cost shall not exceed 1 ½% of the cost of the price change.

EFFECT OF PAYMENT

Change Order Compensation is All Inclusive

Except as provided expressly below regarding changes that extend the Contract Time, payment of calculated cost of extra work constitutes full and complete compensation for costs or expense arising from the extra Work, and is intended to be all inclusive.

Payment for Direct Cost of Construction (Component A Labor or LEMS) is intended to be all-inclusive. Any costs or risks not delineated within cost of labor, equipment or materials herein, shall be deemed to be within the costs and risks encompassed by the applicable Markups and unallowable in any separate amount.

Payment of Markup (Component B Markup) is intended to be all-inclusive. Contractor waives claims for any further or different payment of cost and risk items delineated herein, other than the allowable percentage markup on costs set forth in the Contract Documents; such separate, further or different cost or risk items shall be unallowable, waived and liquidated within the allowable percentage markup.

Contractor shall recover no other costs or markups on extra work of any type, nature or description.

Exception for Changes Extending the Contract Time

Where a change in the Work extends the Contract Time, Contractor may request and recover additional, actual direct costs, provided Contractor can demonstrate such additional costs are actually incurred performing the Work, not compensated by the Markup allowed, and directly result from the extended Contract Time. Contractor shall make such request and provide such documentation following all required procedures, documentation and time requirements in the Contract Documents, and subject to all contract limitations of liability. Contractor may not seek or recover such costs using formulas (e.g., Eichleay).

Limits of Liability / Accord and Satisfaction

The foregoing limits of compensation apply in all cases of claims for changed Work, whether calculating Change Order Requests, Change Orders or CDs, or calculating claims and/or damages of all types, and applies even in the event of fault, negligence, strict liability, or tort claims of all kinds, including strict liability or negligence. Contractor may recover no other costs arising out of or connected with the performance of extra Work, of any nature.

Under no circumstances may Contractor claim or recover special, incidental or consequential damages against Owner, its representatives or agents, whether arising from breach of contract,

negligence, strict liability or other tort or legal theory, unless specifically and expressly authorized in the Contract Documents.

No change in Work shall be considered a waiver of any other condition of Contract Documents. No claim shall be made for anticipated profit, for loss of profit, for damages, or for extra payment whatever, except as expressly provided for in Contract Documents.

Accord and Satisfaction: Every Change Order and accepted CD shall constitute a full accord and satisfaction, and release, of all Contractor (and if applicable, Subcontractor) claims for additional time, money or other relief arising from or relating to the subject matter of the change including, without limitation, impacts of all types, cumulative impacts, inefficiency, overtime, delay and any other type of claim. Contractor may elect to reserve its rights to disputed claims arising from or relating to the changed Work at the time it signs a Change Order or approves a CD, but must do so expressly in a writing delivered concurrently with the executed Change Order or approved CD, and must also submit a Claim no later than thirty (30) Days after Contractor's first written notice of its intent to reserve rights. Execution of any Change Order or CD shall constitute Contractor's representation of its agreement with this provision.

MISCELLANEOUS REQUIREMENTS

Owner-Furnished Materials

Owner reserves right to furnish materials as it deems advisable, and Contractor shall have no claims for costs and Markup on such materials.

Records and Certification

All charges shall be recorded daily and summarized in Change Order Request form attached hereto. Contractor or authorized representative shall complete and sign form each day. Contractor shall also provide with the form: the names and classifications of workers and hours worked by each; an itemization of all materials used; and a list by size type and identification number of equipment and hours operated.

Owner shall have the right to audit all records in possession of Contractor relating to activities covered by Contractor's claims for modification of Contract, including CD Work. This right shall be specifically enforceable, and any failure of Contractor to voluntarily comply shall be deemed an irrevocable waiver and release of all claims then pending that were or could have been filed.

END OF DOCUMENT

6-D SUBMITTALS**TIMELY SUBMITTAL**

The Contractor shall have submitted the following data as required in these Specifications before request is made for first progress payment. Submittal of the following data shall be regarded as an essential part of the construction operation that is required before any progress payment will be made.

Schedule of Values (Cost Breakdown) as specified herein and in the General Conditions.

Bill of Materials, which shall itemize the quantity of all materials for the Project correlated with each item in the cost breakdown.

Schedule of submittals as specified herein.

List of materials as specified herein.

Construction Schedule.

Contractor may expect submittal turnaround in ten (10) working days' maximum for most submittals. Some submittals may take longer than ten (10) working days depending on the volume and complexity of the submittals.

PROGRESS REPORTS**Daily Reports**

The Contractor shall prepare a Daily Report for every working day giving brief particulars of work accomplished, number of workers employed for each trade, and weather conditions.

Distribution

One (1) copy of the Daily Report shall be mailed to the Owner's Representative no later than one day after the day covered by the report. One copy shall be delivered to the Owner's Inspector no later than 8:15 a.m. on the day after the day covered by the report. The Contractor's delivery of complete and accurate daily reports on a daily basis is a material obligation of the Contractor under the Contract Documents.

SCHEDULE OF VALUES

Provide cost breakdown of the Contract Price, itemizing estimated cost of each class of Work.

Include line item amounts for mobilization, bonds and insurance. Mobilization shall be limited to one percent of the total contract amount.

An amount equal to one percent of the total contract amount shall be designated for punch list work. Values will be assigned to individual punch list items as the punch list is compiled. If the aggregate value of these items is less than the one percent designated for this work, the difference will be included in the next payment to the Contractor.

An amount equal to one percent of the total contract amount shall be assigned to the Contract Closeout items.

SCHEDULE AND FORM OF SUBMITTALS

Schedule

Within thirty (30) days after the date of commencement specified in the Notice to Proceed. Schedule shall list submittals and indicate date submittal will be made.

Form

Number each submittal beginning with the applicable 5-digit specification section followed by a 3-digit number ie: 001, 002, etc., representing the order in which the submittals were submitted. Re-submittals shall use original submittal number followed by "R." For additional re-submittals, use the original submittal number followed by "R2," "R3," etc.

SCHEDULE FORMAT

Prepare Schedules as a horizontal bar chart or CPM with separate bar for each major portion of Work operation, identifying first work day of each week.

The Contractor shall develop a Critical Path Method Schedule demonstrating fulfillment of all contract requirements. The project schedule shall be kept current to be utilized for scheduling, coordinating, monitoring work progress, and for preparation of the monthly payment application for payment under the Contract including all Work of Subcontractors and equipment and material suppliers.

Sequence of Listings

The chronological order of the start of each item of Work.

Scale and Spacing

To provide space for notations and revisions.

SCHEDULE CONTENT

Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

The Contractor shall develop a Critical Path Method Schedule demonstrating fulfillment of all contract completion milestone requirements. The project schedule shall be kept current to be utilized for scheduling, coordinating, monitoring work progress, and for preparation of the monthly payment application for payment under this Contract including all Work of Subcontractors and equipment and material suppliers.

Schedule shall include activities pertaining to long lead delivery items, fabrication items and submittal of shop drawings and product samples.

Show coordination with Owner work and other contractors.

OFFICIAL CONTRACT SCHEDULE (AKA "PROJECT CONSTRUCTION SCHEDULE")

Project Construction Schedule

The Critical Path Method Schedule to be prepared by the Contractor pursuant to this section will be a part of a total system for scheduling, reporting work progress, and preparing the monthly payment application.

Within ten (10) working days after the Notice to Proceed, the Contractor shall submit to the Owner's Construction Manager four original prints of the complete project construction schedule for approval or disapproval. In the event the complete project schedule is disapproved; the Contractor shall resubmit a correct schedule within five (5) working days after the notice of disapproval is received by the Contractor.

Should the Project Construction Schedule not be accepted within thirty (30) calendar days after Notice to Proceed, the Contractor may be due provisional progress payment(s) on work performed. It is the responsibility of the Contractor to reconcile such cost information and payments with the Project Contract Schedule. However, no payment shall be approved after the thirty (30) calendar day period, until the Project Contract Schedule has been accepted by the Owner.

The initial submittal of the Project Contract Schedule shall not reflect contract changes of delays. These changes shall be added within the first schedule revision.

Project Construct Schedule Elements

The Project Construction Schedule shall include, in addition to construction activities, the following:

- A. The submittal and approval of construction drawings, shop drawings and materials, the procurement and fabrication of major materials and equipment, and their installation and testing.
- B. Contract requirements dates of all or parts of the Work will be shown including all activities of the Owner that affect the progress of the work.
- C. Activities of completed work ready for use by next trade, etc.
- D. Activities relating to different areas of responsibility, such as sub-contracted Work which is distinctly separate from that being done by Contractor directly.
- E. Different categories of Work as distinguished by craft or crew requirements.
- F. Different categories of Work as distinguished by materials.
- G. Location of Work within the project that necessitates different times or crew to perform.
- H. Outage schedules of limiting times that existing utility services may be interrupted to construct the Project.
- I. Acquisition and installation of equipment and materials supplied and/or installed by Owner or separate Contractors.
- J. Material stored on site.

Major Equipment/Materials

For all major equipment and materials fabricated or supplied for Project, the Construction Schedule shall show a sequence of activities including:

- A. Preparation of shop drawings and sample submissions.
- B. Review of shop drawings and samples.
- C. Shop fabrication, delivery, and storage.
- D. Erection or installation.
- E. Test of equipment and materials.

F. Required dates of completion.

Early Completion: Include in Project Construction Schedule an early completion date for the Project that is no later than Project's required date of completion.

Construction activities are to be delineated separately for off-site sewer, site development, earthwork, utilities, roads, parking lots, fences and like Work and each building, separately.

The network diagrams shall clearly indicate any work that is planned to be accomplished on a work schedule other than eight (8) hours per day and forty (40) hours per week.

The basic concept of CPM network diagramming will be followed to show how the start of a given activity is dependent on the completion of preceding activities and its completion restricts the start of following activities. The diagrams shall show a continuous flow from left to right to left sequences.

The following information will be provided in a report for each network activity:

- A. Activity description.
- B. Activity duration in work days.
- C. Activity cost. The Contract Price shall be broken down with the appropriate values distributed to the network diagram activities.
- D. Working activities and General Conditions activities shall be identified separately.
- E. Activity predecessors.
- F. Activity successors.

Schedule review by the Owner and its agents is limited to ensuring the logic of sequencing is reasonable and Contractor had demonstrated ability to meet contractual milestone and completion dates. Approval of schedule should not be constructed as direction from the Owner to Contractor on how to schedule the work.

After Completion and Acceptance of the Official Project Construction Schedule: The Contractor will provide initial computer reports and weekly and monthly reports thereafter, as follows.

Three-week Window: Weekly, for the progress meeting, the Contractor shall produce a three-week window of the current schedule, indicating activities completed the previous week and activities scheduled for the current and following week.

Payment Progress Reporting

Owner and Contractor shall select a specified time for updating the Project Schedule at the jobsite each month.

- A. The Owner and Contractor and his/her designated scheduling representatives will attend the meeting to review the project progress.
- B. The schedule shall be the basis for monthly pay requests derived from the joint review of the cost loaded schedule.
- C. All progress and status information provided by the Contractor shall clearly define the reporting period for which the status is provided.

At the monthly progress review meeting, the Contractor will provide “actual start” and “actual completion” dates for activities that were started or completed during the reporting period. The Contractor and the Owner will agree upon and assign percent complete values to activities in progress. In the event of a disagreement, the Owner, or its designated representative, shall make the final decision as to percent completion of each activity.

After joint review, Owner will process the Contractor’s pay request based on progress from the schedule.

Payment to the Contractor shall be made from the progress reflected by the Interim or the Contract Schedule.

Time is of the Essence: Whenever it becomes apparent from the current monthly progress review that phases of Work or the Contract Completion Date will not be met, through no fault of the Owner, the Contractor will take the following actions with no change in the contract amount:

- A. Increase construction manpower to eliminate an adverse backlog of work.
- B. Increase the number of working hours per shift, shifts per day, working days per week, the amount of construction equipment, or any combination of the foregoing to eliminate the adverse backlog of Work.

The Official Project Construction Schedule as approved by the Owner will be an integral part of the Contract, and will establish interim Contract Completion Dates or milestone dates for the various activities.

Should any activity fall fifteen (15) work days or more behind the Official Project Construction Schedule approved by the Owner, the Owner will have the right to order the Contractor to

expedite completion of that activity using whatever means are appropriate and necessary, without additional compensation to the Contractor.

Should any activity fall twenty (20) or more work days behind the Official Contract Schedule approved by the Owner, through no fault of the Owner, the Owner will have the right to perform the activity or have the activity performed by whatever method the Owner deems appropriate. All costs incurred by the Owner in connection with expediting such activity under this subparagraph shall be reimbursed promptly to the Owner by the Contractor.

It is expressly understood and agreed that the failure by the Owner to either order the Contractor to expedite an activity or to expedite the activity by other means, pursuant to the two preceding paragraphs, shall not be considered precedent setting with respect to any other activities which may fall behind the Official Contract Schedule approved by the Owner; nor will it relieve the Contractor from completion of the Project Work in accordance with the Official Contract Schedule and the Contract Completion Date.

Owner's acceptance of, or its review of, comments about any schedule or scheduling data shall not relieve the Contractor from its sole responsibility to plan for, perform, and complete the Work within the Contract Time. Acceptance of or review of comments about any schedule shall not transfer responsibility for any schedule to Owner nor imply their agreement with (1) any assumption upon which such schedule is based, or (2) any matter underlying or contained in such schedule.

Failure of Owner to discover errors or omissions in schedules that it has reviewed, or to inform Contractor that Contractor, Subcontractors, or others are behind schedule, or to direct or enforce procedures for complying with the Contract Schedule shall not relieve Contractor from its sole responsibility to perform and complete with Work within the Contract Time and shall not be a cause for an adjustment of the Contract Time or the Contract Sum.

Schedule Revisions

General: Revisions to approved Construction Schedule must be approved in writing by the Owner and Contractor.

Contractor: Submit requests for revision to schedule to the Owner together with written rationale for revisions and description of logic for researching Work and maintaining Specific Contractual Milestone Dates listed in Contract Documents.

Proposed revisions acceptable to Owner will be incorporated into next update of Construction Schedule.

Acceptance: Acceptance of revised schedule by Owner does not relieve Contractor of meeting contractual milestone and completion dates.

Changes initiated by Owner and implemented by Change Orders which have potential to affect critical dates will require the Contractor to prepare revised schedule for Owner's concurrence. Once Owner agrees to revision, Contractor will incorporate it into updated Construction Schedule. Adjustments in schedule completion dates, either for intermediate activities or for Contract as a whole, will be considered for compensation only to extent that there is not sufficient float to absorb the revisions accepted.

RECOVERY SCHEDULE

General: Should updated Project Construction Schedule show Contractor to be fourteen (14) or more calendar days behind schedule at any time during construction, Contractor will prepare Recovery Schedule displayed on CPM schedule, at no additional costs to Owner. Prepare Recovery Schedule to show plan for returning to original schedule as expeditiously as possible.

Schedule Assessment: Five (5) days prior to expiration of Recovery the Owner and Contractor will meet with Construction Manager to assess effectiveness of Recovery Schedule. As a result of this conference, Owner will direct Contractor as follows:

- A. Behind Schedule: If Owner determines Contractor is still behind schedule, Owner will direct Contractor to prepare another Recovery Schedule for subsequent pay period.
- B. On Schedule: If Owner determines Contractor has successfully complied with provisions of Recovery Schedule, Owner will direct Contractor to return to use of Project Construction Schedule.

SUBMITTAL REQUIREMENTS

General: Submit a minimum three (3) sets of submittals for Owner, Owner Representatives, and Contractor Copy. The submittal shall include but not be limited to the following materials:

Asphalt Concrete

Gradation and Type per Plans.

Bedding, Backfill (including permeable backfill), and Aggregate Base

Certificate of Compliance with appropriate gradation specifications;

Sieve Analysis;

Mix Design (Sand/Cement Slurry, Controlled-Density Backfill).

Control and Instrumentation Systems

Manufacturer's resumes
Catalog cuts
Dimensional drawings
Logic diagrams
Ladder diagrams with plain language narrative
Wiring diagrams
Block diagrams
Programming manual
Parts lists including source of supply
Nameplate data
Manufacturer's warranty

Copper Pipe, Tubing, and Fittings

Certificate of Compliance with AWWA C800

Ductile Iron Fittings

Certificate of Compliance with AWWA C110 or C153
Catalog cuts
Details showing dimensions and installation procedures

Ductile Iron Pipe

Certificate of Compliance with AWWA C151
Details showing dimensions and installation procedures

Electrical Equipment including Panels, Switch Gear, Lighting, Low-Voltage Electrical

Certificate of Compliance with Underwriter's Laboratories as appropriate
Certificate of Compliance with NEMA and NEC as appropriate
Catalog cuts
Dimensional drawings and details
Wiring diagrams
Ladder diagrams
Parts list including sources of supply
Short circuit calculations
Bench test results and performance curves
Complete installation and operations manuals
Breaker/fuse coordination diagrams
Breaker/fuse assignment list
Nameplate data
Manufacturer's warranty

Flowmeters, Residential Service (Domestic) Meters

Certificate of Compliance with AWWA C701, C703, and C704

Details showing dimensions and installation procedures

Galvanized Iron Pipe

Certificate of Compliance with AWWA C800

Details showing dimensions and installation procedures

Painting and Coating Systems including Caulking and Sealants

Color chips

Full material specifications including hazardous materials handling requirements

Material Safety Data Sheets

Application instructions

Certificates of Compliance with AWWA and ASTM specifications

Service Tubing and Fittings

Certificate of Compliance with AWWA C800 and C901

Details showing dimensions and installation procedures

Drainage Pipe and Fittings

Certificate of Compliance with ASTM F405, F667, and F810

Details showing dimensions and installation procedures

Polyvinyl Chloride (PVC) Pipe

Certificate of Compliance with AWWA C900, AWWA C905, AWWA C800, ASTM D1785, and ASTM D2241

Details showing dimensions and installation procedures

Precast Concrete Structures: Grates, Drainage inlets, Meter and Valve Boxes, and Vaults

Manufacturer's Resume citing Work of a similar nature within the previous 5-years

Structural calculations

Structural plans and details

Concrete mix designs

Specifications for installation

Manufacturer's warranty

Material specifications

Certificate of Compliance with ASTM Standards as appropriate

Catalog cuts as appropriate.

Pump Suction Barrels

Certificate of Compliance with AWWA C200

Details showing dimensions, welding, and installation procedures as appropriate

Pumping Equipment including Domestic Service Pumps, Chemical Feed Pumps, and Air Compressors

Manufacturer's Resume

Catalog cuts

Certificates of Compliance with AWWA Specifications as appropriate

Pump Curves including pumping rates at specified heads, NPSH Curves, and Efficiency Curves

Complete mechanical drawings

Complete electrical drawings including schematics, wiring, motors, connections, ladder diagrams with plain language narrative, and controls

Complete installation, maintenance, and operations manuals

Parts list including sources of supply

Bench test results

Nameplate data

Manufacturer's warranty

Retaining Wall Systems including but not limited to, Concrete Masonry Units, Structural Steel and Timber, Cast-in-Place Portland Cement Concrete, Pre-Cast Portland Cement Concrete, Crib Type, and Gabion/Mattress Type

Certificates of Compliance with ASTM Standards as appropriate

Dimensional drawings and details

Color chips

Structural calculations and design data

Reinforcing steel diagrams

Erection, bending, and placement drawings

Mix design for mortar and grout

Parts list including sources of supply

Welder certifications

Bench test results

Complete installation, operation, and maintenance manuals

Treatment Works

Manufacturer's Resume

Catalog cuts

Certificates of Compliance with AWWA Specifications as appropriate

Pump Curves including pumping rates at specified heads, NPSH Curves, and Efficiency Curves;

Complete mechanical drawings

Complete electrical drawings including schematics, wiring, motors, connections, ladder diagrams with plain language narrative, and controls

Complete installation, maintenance, and operations manual

Parts list including sources of supply

Bench test results

Nameplate data

Manufacturer's warranty

Valves including Control, Air and Air/Vacuum, Line Valves, Hydrants, Flood Control Valves, Flap Gates, Meters, and Small Valves and Couplings

Certificate of Compliance with AWWA Specifications as appropriate

Catalog cuts

Dimensional drawings and details

Complete mechanical drawings and details

Complete electrical drawings including schematics, wiring, motors, connections, ladder diagrams with plain language narrative, and controls

Water Storage Tanks, Hydro-Pneumatic Tanks, Chemical Storage Tanks, Fuel Tanks

Manufacturer's Resume

Catalog cuts

Certificates of Compliance with AWWA Specifications as appropriate

Complete mechanical drawings as appropriate

Complete installation, maintenance, and operations manuals

Parts list including sources of supply

Nameplate data

Manufacturer's warranty

DISTRIBUTION

Distribute copies of Project Construction Schedule to project site file, Subcontractors, suppliers, and other concerned parties.

Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Schedules.

END OF DOCUMENT

6-E MEASUREMENT AND PAYMENT**UNIT PRICES**

Unit Prices quoted in the Bid Form are for additions of (and deletions of) approved items of work. All Unit Prices quoted shall be for installed, completely furnished, and operable modifications according to the Contract Documents, and shall include profit, overhead, taxes, cost of coordinating the Unit Price work with adjacent work, compensation for risk of loss or damage to the Work regardless of cause, all expenses due to delays in performance, so they are the complete price to the District. The Unit Prices shall not apply to work the Contractor elects to do for its own convenience or to correct errors committed by the Contractor.

All Unit Prices shall remain in effect during construction and will be used to adjust the Contract Sum.

The Contractor shall immediately notify the District's Representative when conditions indicate the probability of the need to make use of any Unit Price work.

The applicability of, measurement methods for, documentation of, and the final adjustment in the Contract sum for Unit Price work shall be determined by the District's Representative.

After performing Unit Price work as directed by the District's Representative, the Contractor shall take necessary measurements in the presence of the District's Inspector and shall submit calculations of the quantities to the District's Representative for approval. The Contractor shall notify the District's Inspector one (1) day in advance of taking measurements.

APPLICATION FOR PAYMENT

The Contractor shall submit monthly, on the first working day of each month, to the District's Representative, Application for Progress Payments, on forms approved by the District, setting forth an itemized estimate of Work completed in the preceding month for the purpose of the District's making of Progress Payments thereon. Valuation utilized in the Application for Progress Payments shall be based upon the District pre-approved Cost Breakdown and shall be only for determining the basis of Progress Payments to Contractor and shall not be considered as fixing a basis for adjustments, where additive or deductive to the Contract Price or for determining the extent of Work actually completed. A Sample Application for Payment is included in Section 7.

END OF DOCUMENT

6-F PROJECT MEETINGS**PRECONSTRUCTION CONFERENCE**

Prior to mobilization or the commencement of any work on the Project site, and not later than 14 days after issuance of the Notice to Proceed, a pre-construction conference will be scheduled. The pre-construction conference will be conducted by the Owner's Representative to discuss timing procedures for smooth job progress, items requiring clarification, distribution of documents and correspondence with the Owner and the Owner's Representative, and other procedures which are to be followed during performance of the Work.

Location

On the Project site, as designated by the Owner's Representative.

Attendees

Owner

Owner's Representative

Engineer and the Engineers Consultants;

Contractor

Contractor's Project Manager

Contractor's Superintendent

Subcontractors, as appropriate

Others, as appropriate

Agenda

The agenda will include:

- A. Distribution of a list of major subcontractors and suppliers and the Project Construction Schedule.
- B. Critical work sequencing.
- C. Major equipment deliveries and priorities.
- D. Project coordination.
- E. Designation of responsible personnel.
- F. Procedures and processing of field decisions; submittals; modifications (Change Orders and Field Orders); proposal requests, cost proposals, supplemental information, requests for information (RFI) and applications for payment.
- G. Adequacy of distribution of Contract Documents.
- H. Procedures for maintaining Record Documents.
- I. Use of premises for office, work, and storage areas and the owner's representative's requirements.

- J. Construction facilities, controls, and aids; temporary utilities; tree protection procedures; erosion control; owner's operations and maintenance department concerns; housekeeping procedures; insurance requirements; wage and hour compliance; conducting work in operating facility and noise control.
- K. Other subjects as appropriate.

END OF DOCUMENT

6-G PROGRESS MEETING

During the course of construction, progress meetings will be held to discuss and resolve field problems.

OWNER'S REPRESENTATIVE RESPONSIBILITIES

The Owner's Representative shall schedule and administer weekly progress meetings and specially called meetings throughout progress of the Work:

Prepare agenda for meetings.

Make physical arrangements for meetings.

Preside at meetings.

Record minutes, including significant proceedings and decisions. Items not concluded will be retained on the agenda and in the minutes until conclusion is recorded in subsequent minutes. Format of the minutes shall be as mutually agreed upon by the Contractor and the Owner's Representative.

Reproduce and distribute copies of minutes within four (4) working days after each meeting to participants in meeting and to parties affected by decisions made at meeting.

Attendees taking exception to items contained in the minutes shall state their objections, in writing, within one (1) working day prior to the next scheduled meeting.

Representatives of Contractor, subcontractors and suppliers attending meeting shall be qualified and authorized to act on behalf of entity each represents.

The weekly time and day of job meetings shall be mutually agreed upon by all parties concerned and once determined the job meeting shall be held every week on the same day and at the same time.

The Location will be designated by the Owner's Representative.

Attendees

Owner

Owner's Representative

Engineer and the Engineers Consultants

Inspector

Contractor

Contractor's Project Manager

Contractor's Superintendent
Subcontractors, as appropriate
Others, as appropriate

BILLING MEETING

The Contractor shall conduct the billing meeting each month prior to submittal of the Application for Payment. During this meeting, the percentage of completing will be discussed.

The Location will be designated by the Owner's Representative

Attendees

Owner
Owner's Representative
Engineer and the Engineers Consultants
Inspector
Contractor
Contractor's Project Manager

END OF DOCUMENT

6-H TESTING AND INSPECTION**DEFINITIONS**

The term "The Owner's Testing Laboratory" means a testing laboratory retained and paid for by the Owner for the purpose of reviewing material and product reports and performing other services as determined by the Owner. The Owner will select an independent Testing Laboratory to conduct tests. Selection of the material to be tested will be by the Laboratory or the Owner's Inspector and not by the Contractor.

The term "Contractor's Testing Laboratory" means a testing laboratory retained and paid for by Contractor to perform the testing services required by the Contract Documents. Contractor's Testing Laboratory shall be an organization other than the Owner's Testing Laboratory and shall be acceptable to the Owner's Representative. It may be a commercial testing organization, the testing laboratory of a trade association, the certified laboratory of a supplier or manufacturer, Contractor's own forces, or other organization. Contractor's Testing Laboratory shall have performed testing of the type specified for at least five (5) years.

The term "The Owner's Inspector" or "Inspector of Record" means an inspector retained and paid for by the Owner for the purpose of observing the progress of the Work and insuring compliance with the Contract Documents and applicable codes and regulations.

GENERAL

Contractor shall perform all tests as specified herein and as may be required to insure and demonstrate proper installation and operation of materials and equipment in this Contract.

Tests, inspections, and acceptances of portions of the Work required by the Contract Documents or by Applicable Code Requirements shall be made at the appropriate times. Except as otherwise provided, Contractor shall make arrangements for such tests, inspections, and acceptances with Contractor's Testing Laboratory. Contractor shall give the Owner's Representative timely notice of when and where tests and inspections are to be made.

If such procedures for testing, inspection, or acceptance reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, Contractor shall bear all costs made necessary by such failure including those of repeated procedures and compensation for the Owner's Representative's, the Owner's Representative's Consultants', and the Owner's Inspector's services and expenses.

If the Owner's Representative or the Owner's Inspector is to observe tests, inspections, or make acceptances required by the Contract Documents, the Owner's Representative or the Owner's Inspector will do so promptly and, where practicable, at the normal place of testing.

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

The Work will be available for inspection at any and all times for the Owner, the Owner's Representative or the Owner's Inspector. Contractor will be expected to consult and cooperate with the Owner's Representative or the Owner's Inspector in regard to all requirements as set forth in the Contract Documents.

The Owner will select and pay Owner's Testing Laboratory costs for all test and inspections, but shall be reimbursed by the Contractor for certain cost as specified herein. Any direct payments by the Contractor to the Testing Laboratory on this Project is prohibited.

TESTING AND INSPECTION

Project Inspectors

The Owner will employ one or more qualified inspectors, acceptable to the Owner's Representative, who will be employed at Project site to observe progress of Work and to report to the Owner's Representative any nonconformance with the Contract Documents.

Geotechnical Engineer

The Owner will retain and pay the expenses of a Geotechnical Engineer to perform inspection, testing, and observation functions specified by the Owner. Geotechnical Engineer shall communicate only with the Owner and the Owner's Representative. The Owner's Representative shall then give notice to Contractor, with a copy to the Owner, of any action required of Contractor.

Persons performing testing and inspections shall not be authorized to:

- A. Release, revoke, alter or enlarge requirements of the Contract Documents.
- B. Stop Work except as may be required to perform testing or inspection operations.
- C. Advise on or issue directions relative to any aspect of construction means, methods, techniques, sequences, or procedures.

Contractor's Responsibilities

Maintain quality control over suppliers, manufacturers, products, services, site conditions and

workmanship, to produce work of specified quality. Testing and inspection shall not relieve Contractor of his responsibility for quality of materials in place.

Be responsible for scheduling all testing and inspections specified.

- A. Schedule work that is to be tested or inspected so that tests can be performed within a reasonable time period.
- B. Notify and obtain concurrence of Project Inspector prior to scheduling testing or inspection by Testing Laboratory or Geotechnical Engineer.
- C. Notify the Owner's Representative in writing on the form contained within the Project Manual at least forty-eight (48) hours in advance of operations on site requiring testing or inspection.
- D. Notify the Owner's Representative and the Owner's Inspector in writing on the form contained within the Project Manual a minimum of three (3) working days in advance of off-site operations requiring testing or inspection, in order that testing at the source can be arranged without delaying Work.
- E. Material shipped by the Contractor from the source of supply before having satisfactorily passed such testing and inspection, or before the receipt of notice from the Owner's Inspector that such testing and inspection will not be required, shall not be incorporated into the work.
- F. Notify the Owner's Representative in writing on the form contained within the Project Manual at least four (4) working days prior to commencement or resumption of operations requiring observation or testing by the Owner's Geotechnical Engineer.
- G. When a specified test or inspection is not performed due to Contractor's failure to schedule services, the Owner's Representative will establish remedial work and Contractor shall bear cost of remedy.
- H. Additional tests and inspections not herein specified but requested by the Owner or Architect, will be paid for by the Owner, unless results of such tests and inspections are found not in compliance with the Contract Documents, in which case the Owner will pay all costs for initial testing as well as re-testing and re-inspection, and deduct the costs from the Contract sum.

Reimburse the Owner for the following by deduction from Contract Sum:

- A. Costs of testing required because of changes in materials or proportions required by the Contractor.

- B. Where inspections or tests prove unsatisfactory or not in compliance with Contract Documents, costs for further inspection and retesting.
- C. Costs attributable to the Contractor's methods of operation, when these methods result in excessive test and inspection costs to the Owner, and if after warning, costs remain excessive.
- D. Premium time fees for testing performed after regular working hours or on Saturday, Sunday, or on legal holidays; except when testing is required for the Owner's requested overtime work.
- E. Tests arising from errors and omissions by the Contractor.
- F. Retests of materials that fail; tests required by the lack of required identifications of materials (mill tests, manufacturer's certifications, etc.); and re-inspections.
- G. Services required to expedite the Contractor's operations.
- H. Testing and inspection fees for travel and per diem expenses, when shops or plants of fabrication are located more than a 50-mile radius from the Project site.

Where required by individual Sections of the Specifications, the Contractor shall pay all costs associated with inspection and testing without adjustment of the Contract Price or the Contract Time. For example, but not limited to, the following:

- A. Concrete mix designs.
- B. Certified mill test reports.
- C. Qualification of welding procedures, operators and welders.

Repair or replace damage to work made necessary by retesting.

Secure and deliver to the Owner's Testing Laboratory adequate quantities of representative samples of materials proposed for use as specified.

Submit to the Owner's Testing Laboratory the preliminary design mixes proposed to be used for concrete and other materials which require review by the Owner's Testing Laboratory.

Submit copies of product test reports as specified.

Furnish incidental labor and facilities:

- A. To provide the Owner's Testing Laboratory access to the Work to be tested.

- B. To obtain and handle samples at the Project site or at the source of the product to be tested.
- C. To facilitate inspections and tests.
- D. For storage and curing of test samples.

Provide notice to the Owner's Representative sufficiently in advance of operations to allow for the Owner's Testing Laboratory assignment of personnel and scheduling of tests.

When tests or inspections are not performed after such notice, Contractor shall reimburse the Owner for the Owner's Testing Laboratory personnel and travel expenses incurred.

Several Sections of the Specifications require testing by the Contractor's Testing Laboratory.

Maintain and keep available at the Project Site, California Code of Regulations, Part I and Part II, Title 24.

TESTING SERVICES

The Owner may retain Testing Laboratories to observe structure excavation, to test compaction of backfill, and to test concrete, masonry, steel, reinforcing and other construction materials and methods as the Owner's Representative may deem necessary and as the Specifications require. The Testing Laboratory will make as many field observations and tests as are required to determine the acceptability of the Work. Contractor shall provide safe access to the Work as required for the Testing Laboratories to perform sampling and tests.

Testing and inspection services, which are performed, shall be in accordance with the requirements of the California Building Code (CBC), and as specified herein. Testing and inspection services shall verify that Work meets the requirements of the Contract documents.

In general, tests and inspections for structural materials shall include all items enumerated on the Structural drawings as listed for this Project and as prepared and listed by the Architect.

Notice to the Owner's Representative: In instances where the Owner's Representative requires testing and where the Specifications require work to be specially tested or approved, it shall be tested only in the presence of the Owner's Representative after timely notice of its readiness for inspection and test, and the Work after testing shall be covered up only upon the consent thereto of the Owner's Representative.

The results of any tests made are for the information of the Owner. Regardless of any test results, Contractor is solely responsible for the quality of work and materials and for compliance with the requirements of the Drawings and Specifications.

Registered Civil Engineer currently licensed in the State of California shall sign test reports.

ADDITIONAL TESTING AND INSPECTION

If initial tests or inspections made by the Owner's Testing Laboratory, or Geotechnical Engineer reveal that any portion of the Work does not comply with Contract Documents, or if the Owner's Representative determines that any portion of the Work requires additional testing or inspection, additional tests and inspections shall be made as directed.

- A. If such additional tests or inspections establish that such portion of the Work complies with the Contract Documents, all costs of such additional tests or inspections shall be paid by the Owner.
- B. If such additional tests or inspections establish that such portion of the Work fails to comply with the Contract Documents, all costs of such additional tests and inspections, and all other costs resulting from such failure, including compensation for the Owner's Representative and the Owner's consultants shall be deducted from the Contract Sum.

TEST REPORTS

Certification and Copies

The Owner's Testing Laboratory will furnish certified reports summarizing results of inspection, indicating observations and results of tests and indicating compliance or non-compliance with the Contract Documents, and other equipment as to adequacy and compliance, and results of tests and inspections. The Owner's Testing Laboratory will make copies and distribute test and inspection reports as follows:

Owner.	1 copy
Owner's Engineer/Architect.	2 copies
The Owner's Inspector.	1 copy
Contractor.	1 copy
Construction Manager.	2 copies

Test reports shall include all tests made, regardless of whether such tests indicate that the material is satisfactory or unsatisfactory. Samples taken but not tested shall also be reported. The reports shall show that the material or materials were sampled and tested in accordance with the requirements of CBC and with the Contract Documents. The reports shall also state definitely whether or not the material or materials tested comply with the requirements.

Contractor's Testing Laboratory shall submit four (4) copies of all reports to the Owner's Representative, indicating observations and results of tests and indicating compliance or non-compliance with the Contract Documents.

Form: Reports will clearly distinguish type of test, material tested, whether original (first) test or retest, and related information.

SAMPLES AND MATERIALS

Contractor shall furnish samples and materials for testing free of charge, and shall provide job storage facilities.

AVAILABILITY OF SAMPLES

Contractor shall make materials required for testing available to Laboratory and assist in acquiring these materials as directed by the Owner's Inspector. The samples shall be taken under the immediate direction and supervision of the Testing Laboratory or Inspector.

If Work that is required to be tested or inspected is covered up without prior notice or approval, such Work may be uncovered at the discretion of Architect at no additional cost to the Owner. Refer to Article 1.05 above.

Unless otherwise specified, Contractor shall notify Testing Laboratory a minimum of 10 working days in advance of all required tests, and a minimum of 2 working days in advance of all required inspections. Extra laboratory expenses resulting from a failure to notify the Laboratory will be paid by the Owner and back-charged to the Contractor.

Contractor shall give sufficient advance notice to Testing Laboratory in the event of cancellation or time extension of a scheduled test or inspection. Charges due to insufficient advance notice of cancellations or time extension will be paid for by the Owner and back-charged to the Contractor.

REMOVAL OF MATERIALS

Unless otherwise directed, materials not conforming to the requirements of Contract Documents shall be promptly removed from the Project site.

INSPECTION BY THE DISTRICT

The Owner's Inspector shall at all times have access for the purpose of inspection to all parts of the Work and to the shops wherein the Work is in preparation, and the Contractor shall at all times maintain proper facilities and provide safe access for such inspection.

he Owner's Inspector shall have the right to reject materials and workmanship that are defective, or to require their correction. Rejected workmanship shall be satisfactorily corrected and rejected materials shall be removed from the premises without cost to the Owner. If the Contractor does not correct such rejected Work within a reasonable time, fixed by written notice, the Owner may correct such rejected Work and charge the expense to the Contractor.

Should it be considered necessary or advisable by the Owner at any time before final acceptance of the entire Work to make an examination of Work already completed by removing or tearing out completed Work, the Contractor shall on request promptly furnish necessary facilities, labor and materials. If such Work is found to be defective in any respect because of the fault of the Contractor or Installer, he shall defray all expenses of such examinations and of satisfactory reconstruction. If, however, such Work is found to meet the requirements of the Contract, the additional cost of labor and material necessarily involved in the examination and replacement shall be allowed the Contractor.

An Inspector employed by the Owner will be assigned to the Work.

The Contractor shall notify the Inspector a minimum of 24 hours in advance of execution of all Work that requires special or continuous inspection.

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

UNDESIRABLE CONDITIONS / NONCONFORMANCE

Substandard Test Results: When test or inspection reveals undesirable conditions, nonconformance or failure to meet requirements, the Owner's Testing Laboratory will notify the Owner's Representative. The Owner's Representative will notify Contractor that the Work does not meet requirements and is rejected.

Immediately upon Testing Laboratory determination of a test failure, the Laboratory shall telephone the results of the test to the Owner's Representative and the Architect. On the same day, the Laboratory shall send written test results via facsimile to those names on the distribution list above.

Correction: Work done or materials delivered that fail to comply with requirements of Specifications or Drawings shall be rejected and shall immediately be made satisfactory at no additional expense to the Owner.

MATERIALS AND WORK QUALITY

All work under all Sections shall be performed in strict accordance with the highest standards of practice related to the trades involved and shall be complete and properly coordinated with all work adjacent or related to it.

All materials must be of the specified quality and equal to approved samples, if samples have been submitted. All work shall be done and completed in a thoroughly high-quality manner, notwithstanding any omission from these Specifications, or the Drawings, and it shall be the duty of Contractor to call the Owner's Representative's attention to apparent errors or omissions and request written instructions before proceeding with the Work. The Owner's Representative may, by appropriate instructions, correct errors and supply omissions; such instructions shall be as binding upon Contractor as though contained in the original Specifications or Drawings.

All defective work or materials shall be promptly removed from the premises by Contractor, whether in place or not, and shall be replaced or renewed in such manner as the Owner's Representative may direct. All materials and work quality of whatever description shall be subjected to the inspection of, and rejection by the Owner's Representative if not in conformance with the Specifications. The decision of the Owner's Representative is final and conclusive upon the parties.

Any defective material or work quality, or any unsatisfactory or imperfect work which may be discovered before the final acceptance of the Work or within the initial (and any extended) warranty period, shall be corrected immediately as required by the Owner, without extra charge, notwithstanding that it may have been overlooked in previous inspections and estimates. Failure to inspect work shall not relieve Contractor from any obligation to perform sound and reliable work as herein described.

APPROVAL

Approval of the Work in part or as a whole by the Owner's Representative shall not relieve Contractor of the responsibility for such compliance with the requirements of the Contract Documents. Such approvals may be withdrawn at any time that subsequent examination reveals that apparently satisfactory Work is, in fact, either defective or otherwise fails to

comply. Such work from which approval has been withdrawn shall be replaced or re-executed in accordance with the Contract, at no expense to the Owner.

SPECIFIC TESTING REQUIREMENTS

The following tests and inspections as detailed in applicable specification sections, are required, but not limited to:

EARTHWORK

The Geotechnical Engineer of record or a Geotechnical Engineer selected by the Owner will provide continuous inspection of earthwork, field test fill and earth backfill as placed and compacted, inspect excavations and sub-grade before concrete is placed, and provide periodic inspection of open excavations, embankment, and other cuts or vertical surfaces of earth. The Geotechnical Engineer will submit a report indicating that he has observed and tested fills and that in his opinion the fills were placed in accordance with the Contract Documents.

Contractor shall remove unsatisfactory material, re-roll, adjust moisture, place new material, or in the case of excavations, provide proper protective measures, perform other operations necessary, as approved by the Geotechnical Engineer whose decisions will be considered final.

Soils Test and Inspection Procedure

Allow sufficient time for testing, and evaluation of results before material is needed. The Geotechnical Engineer shall be sole and final judge of suitability of all materials.

Laboratory compaction tests to be used will be in accordance with ASTM D 1557.

Field density tests will be made in accordance with ASTM D 1556.

Number of tests will be determined by Geotechnical Engineer. Materials in question may not be used pending test results.

Excavation and embankment inspection procedure. Geotechnical Engineer will visually or otherwise examine such areas for bearing values, cleanliness and suitability.

Earth Work Test Reports

In order to avoid misinterpretations by the reviewing agencies, any retest results shall be reported on the same sheet, immediately following the previous failure test to which it is related. Retests shall be clearly noted as such.

CONCRETE

Concrete Mix Design

The Owner will pay for the sampling of aggregate and preparation of mix design one time for each strength and aggregate size specified. Testing cost for additional mix designs will be paid by the Owner and back-charged to the Contractor. The Owner will pay tests of materials, but the Contractor will be back-charged for all tests performed on materials that do not meet requirements. Two copies of the mix designs shall be filed with the Architect for record purposes only, not for review or approval.

Test concrete aggregates for mix design only.

Test suitability of aggregates in accordance with ASTM C 88-90 if material is under suspicion and if so directed by Architect.

If compressive test of core specimens fails to show compressive strength specified, remove and replace concrete or adequately strengthen in a manner approved by Architect.

Make all tests, take samples, and prepare samples in accordance with the latest standards adopted by American Society for Testing and Materials, referred to as ASTM.

Frequency of Testing

Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, or not less than once for each 50 cubic yards (38 m³) of concrete, or not less than once for each 2,000 square feet (186 m²) of surface area for slabs or walls. In addition, samples for strength tests for each class of concrete shall be taken for seven-day tests at the beginning of the concrete work or whenever the mix or aggregate is changed.

Concrete shall be mixed at certified automatic concrete batch plants.

Waiver of Batch Plant Inspection

Batch plant inspection may be waived if the concrete plant complies fully with the requirements of UBC Standard 19-3, and has been certified to comply with the requirements of the National Ready Mixed Concrete Association. The plant must be equipped with an automatic batcher in which the total batching cycle, except for the measuring and introduction of an admixture, is completed by activating a single starter device.

Owner's Inspector Responsibilities

Inspect placing of reinforcing steel and concrete at Project.

Obtain load ticket and identify mix before accepting each load. Keep daily record of concrete placement, identifying each truckload, time of receipt, and location of concrete in structure.

During progress of work, take reasonable number of test cylinders as directed by Architect, but at least one set of cylinders for each 100 cubic yards or fractional part thereof for each class of concrete and at least one set from each day's pour. Test cylinders need not be made for concrete used in walks.

One set of cylinders shall consist of 3 samples all taken from same batch, one to be tested at age of 7 days and two at 28 days. The 28-day test may be omitted if the 7-day compressive strength exceeds 85 percent of the specified 28-day strength.

Make and store cylinders according to ASTM C 31-90.

Deliver cylinders to laboratory or store cylinders in a suitable protected environment for pick up by laboratory personnel.

Make slump test of wet concrete according to test for slump of Portland cement concrete, ASTM C 143-90a, at least at the same frequency that the cylinders are taken.

REINFORCING STEEL

Testing

Tests shall be performed before the delivery of steel to Project site. Steel not meeting specifications shall not be shipped to the Project.

Testing procedure shall conform to ASTM A615-90.

Sample at the place of distribution, before shipment: make one tensile test and one bending test from samples out of 10 tons, or fraction thereof, of each size and kind of reinforcing steel, where taken from bundles as delivered from the mill and properly identified as to heat number. Mill analysis shall accompany report. Where identification number cannot be ascertained, or where random samples are taken, make one series of tests from each 2-1/2 tons, or fraction thereof, of each size and kind of reinforcing steel. Tests on unidentified reinforcing steel will be paid by the Owner and back-charged to the Contractor. Samples shall include not fewer than 2 pieces, each 18 inches long, of each size and kind of reinforcing steel. Inspection of welding of reinforcing steel shall be done by a specially qualified laboratory inspector and tested in accordance with AWS D1.4-79.

Owner's Inspector will inspect all reinforcement for concrete Work for size, dimensions, locations and proper placement. Inspector shall be present during welding of all reinforcing steel.

MASONRY

Inspection

Masonry work shall be continuously inspected during laying and grouting by an Inspector.

The Inspector shall check the materials, details of construction and construction procedure. The Construction Inspector shall furnish a verified report that of his own personal knowledge the work covered by the report has been performed and materials used and installed are in accordance with and in conformance to, the duly approved drawings and specifications.

MASONRY TESTS:Concrete Masonry Units

Test each type of unit for strength in accordance with UBC Standard 24-7; absorption in accordance with ASTM C 140-75 (1980); for drying shrinkage in accordance with ASTM C 426-70 (1982); and for staining materials in lightweight concrete in accordance with ASTM C 641-82.

Mortar and Grout Test

At the beginning of all masonry work, at least on test sample of the mortar and grout shall be taken on 3 successive working days and at least at one-week intervals thereafter. The samples shall be continuously stored in moist air until tested. They shall meet the minimum strength requirement given in CCR Title 24, Sec 2103A.3 and 2103A.4 for mortar and grout, respectively. Additional samples shall be taken whenever any change in materials or job conditions occur or whenever in the judgment of the Architect, such tests are necessary to determine the quality of the material. Test specimens for mortar and grout shall be made as set forth in UBC Standard Nos. 21-16 and 21-18. In making the mortar test specimens the mortar shall be taken from the unit soon after spreading. After molding, the molds shall be carefully protected by a covering, which shall be kept damp for at least 24 hours, after which the specimens shall be stored and tested as required for concrete cylinders. In making grout test specimens, an absorbent paper liner shall be used and the mold left in place until the specimen has hardened. The prisms shall be stored as required for concrete cylinders. They shall be tested in the vertical position.

Masonry Core Tests

Not less than 3 cores having a diameter of approximately two-thirds of the wall thickness shall be taken from each project. At least one core shall be taken from each building for each four classrooms or equivalent area. The architect in responsible charge of the project or the Inspector shall select the areas for sampling. Core samples shall not be soaked before testing. Materials and workmanship shall be such that for all masonry when tested in compression, cores shall show strength of at least 1500 psi. When tested in shear the unit shear on the cross section of the core shall not be less than 100 pounds per square inch. Visual examination of all cores shall be made to ascertain if the joints are filled. The Owner Inspector or testing agency

shall inspect the coring of the masonry walls and shall prepare a report of coring operations for general distribution. Such reports shall include the total number of cores cut, the location, and the condition of all cores cut on each project regardless of whether or not the core specimens failed during cutting operation. All cores shall be submitted to the laboratory for examination

STRUCTURAL STEEL

Mill certificates or affidavits and manufacturers' certification shall be supplied to the Testing Laboratory and Inspector for verification of steel materials. Testing Laboratory shall be notified at least 2 Working days in advance of fabrication and supplied with the reports so that it can make a shop inspection of the steel.

Tests of Steel Materials

If structural steel cannot be identified by heat or melt numbers, or if its source is questionable, not less than one tension test and one bend test will be made for each 5 tons or fractional part thereof. Such testing will be paid for by the Owner and back-charged to the Contractor. Structural steel identified by heat or melt numbers marked at the mill need not be tested, except testing is required of steel with F_y greater than 36 ksi.

General Inspection

Testing Laboratory will visit the fabricator's plant to verify that materials used check with the mill tests; affidavits of test reports, and that fabrication and welding procedures meet Specifications.

Testing Laboratory will visually check fabricated steel against the Contract Drawings and reviewed shop drawings for compliance, and will make physical tests and measurements as required to meet the Specifications. Single pass fillet welds may be visually checked.

Inspection of Shop Fabrication

Inspection of shop fabrication may be required for important work if so designated on the Structural Tests and Inspections list. A qualified inspector approved by the DSA shall make this inspection. He shall furnish the Architect and the DSA a report duly verified by him that the materials and workmanship conform to the approved plans and specifications.

Approved Fabricators

In addition to welding inspection, fabrication inspection will be required for all work done on the premises of a steel fabricator who does not hold currently valid certificate CCR Title 24 Part 2, Sec. 306(f), Approved Fabricators. The cost of the fabrication inspection will be paid by the Owner and back-charged to the Contractor.

Inspection of welding shall be in accordance with the requirements of the 2001 CBC, Sec. 2231-A.

Erection Inspection

If so designated on the Structural Tests and Inspections list, Testing Laboratory will visually inspect bolted and field welded connections, perform such additional tests and inspections of field work as are required by the Architect and prepare test reports for the Architect's review.

Shop Fabrication Inspection Outside of Area

The added cost of shop fabrication inspection, and material testing outside the State of California or 150-mile radius of the Project site will be paid by the Owner and back-charged to the Contractor.

Corrections

Correct deficiencies in structural steel Work that inspections and test reports indicate to be not in compliance with the specified requirements.

Perform additional tests required to reconfirm noncompliance of the original Work and to show compliance of corrected Work. Costs for all additional tests will be paid for by the Owner and back-charged to the Contractor.

END OF DOCUMENT

6-I CONTRACT CLOSE-OUT**CLOSE-OUT PROCEDURES**Close-out Submittals

Prior to final payment and before the Owner's Representative issues a final Certificate for Payment, following shall be submitted as directed:

- A. When called for in the Specifications, maintenance materials (extra stock) will be delivered to the Owner at its designated storage location materials, etc., for use in maintenance work.
- B. Provide list of materials and quantities delivered to the Owner indicating date and acceptance by the Owner.
- C. Evidence of compliance with requirements of governing authorities.
- D. Record of all inspections and tests.
- E. Project Record Documents.
- F. Operating and Maintenance Data, Instructions to the Owner's Personnel in suitable transfer cases.
- G. Evidence of Payment and Release of Liens.
- H. Guarantees, Bonds, Service and Maintenance contracts as per Contract.

Final Adjustment of Accounts

The Contractor will prepare a final Certificate for Payment, reflecting approved adjustments to the Contract Sum not previously made by modifications. Submit the final request for payment to the Owner.

The final request shall reflect all adjustments to the Contract Sum as follows:

The original Contract Sum, including accepted alternates.

Additions and deductions resulting from:

- A. Previous modifications (Change Orders).
- B. Unit prices.
- C. Deductions for uncorrected Work.
- D. Deduction for re-inspection payments.
- E. Retainage.

F. Other adjustments.

Total Contract Sum, as adjusted.

Previous payments.

Sum remaining due.

Prerequisites to Final Payment

The Contractor shall satisfactorily fulfill all the following requirements of the Contract before making request for final payment.

Work shall be complete and the Contractor shall receive the Owner's Representative's acceptance of all phases of the Project.

Deliver to the Owner's Representatives and receive the Owner's Representative's written acceptance of the following:

- A. Written Guarantees.
- B. As-built Drawings (original with redlines and AutoCAD Corrections).
- C. Record of all inspections and tests.
- D. File of all operations and maintenance manuals.

Deliver to the Owner a copy of the Final Verified Report filed or to be filed by the Contractor with DSA.

Deliver to the Owner's Representative and receive the Owner's Representative's acceptance of the Owner's Inspection Card(s) with all applicable items thereon signed as having been duly inspected and satisfactorily completed.

PROJECT CLOSE-OUT

Completion of Work

On completion of the Work, the Contractor shall request the final inspection in writing to the Owner's Representative. In the written request for final inspection, the Contractor shall certify that all work specified in the Contract Documents has been completed, including starting of systems. The final cleaning shall be completed prior to requesting the final inspection.

Deficiencies

If deficiencies and omissions by the Contractor are observed, they will be listed by the Owner's

Representative in a written memo (Punch List) to the Contractor and the Owner. The Contractor shall correct all listed deficiencies and omissions in a timely manner until all of the Work is in an acceptable condition and will so certify in writing to the Districts Representative.

Punch List Inspection

After receipt of the Contractor's certification in writing that all deficiencies have been corrected; the Owner's Representative will make a Punch List inspection. The Owner's Representative will notify the Contractor in writing of any items that remain unsatisfactory. The Contractor shall be responsible for all costs for re-inspection due to unsatisfactory work that is incurred by the Owner after the first Punch List inspection.

PROJECT RECORD DOCUMENTS

Record Drawings (As-Built Drawings)

The Contractor shall be solely responsible for the maintenance and completion of As-Built Drawings, and the following procedure shall be strictly adhered to:

The Contractor's shall have one complete set of blueline prints of the Project Drawings, Shop Drawings and Specifications which shall be recorded thereon by the Contractor.

As the Work progresses, a complete and accurate notation of all deviations from the Drawings and Specifications, including but not limited to, work by Change Order, clarifications made via Letters of Instruction, Architect's Supplemental Information, and Requests for Information (RFI's), shall be recorded thereon by the Contractor. Such indications shall be neatly made and kept current. Where exact locations are critical, such as in the case of buried piping or conduit, said locations - both horizontal and vertical - shall be dimensioned.

Maintain at the Project site for the Owner, one record copy of favorably reviewed shop drawings, product data, and samples, field test reports, inspection records, manufacturer's certificates, construction schedule. Store record documents and samples in Field Office apart from documents used for construction. Provide files, racks, and secure storage for Record Documents and samples.

The Contractor shall not request that inspection be made of any Work that has been installed in locations contrary to the Drawings until the Contractor properly notes such deviations on the As-Built Drawings.

The importance of keeping the Record Drawings accurately, neatly and current cannot be overstressed. The Owner's Representative may, if the Owner's Representative deems it necessary, withhold approval of periodic requests for payment if in the Owner's Representative's judgment, the provisions of this Section are not strictly adhered to. All such

requests for payment will be approved immediately, assuming all other requirements of the Contract Documents are satisfied, upon the satisfactory current completion of the Record Drawings.

At the completion of the Project, and before the final request for payment is made and the Owner's Representative's approval obtained, the Record Drawings shall be completed by the Contractor. The Contractor shall transfer all of the indications on the blue-line prints to mylar reproductions of the Working Drawings. The Owner shall provide the mylar reproductions of the Working Drawings. The cost of the mylar reproductions shall be borne by the Contractor.

Approval by the Owner's Representative of the Contractor's final request for payment shall be contingent upon the satisfactory completion and delivery to the Owner of the Record Drawings.

All as-built indications shall be made to the project CAD file.

Maintain Record Documents in a clean, dry, and legible condition. Do not use Record Documents for construction purposes. Keep Record Documents and samples available for inspection by the Construction Manager, Architect/Engineer, and Owner's Inspector.

Upon completion of the Project, the Contractor shall deliver this record of all construction changes to the Construction Manager, for transmittal to the Architect, along with a letter which declares that other than the noted changes, "The Project was constructed in conformance with the Contract Documents."

OPERATING AND MAINTENANCE DATA

Contractor shall assemble and furnish three (3) complete sets of all data, except that which is noted to be mounted in frames, in three-ring loose-leaf binders, complete with index, indexed dividers and permanently attached exterior labels on the cover and back of the binder. Bound publications need not be assembled in binders.

Manufacturers' Manuals

Complete installation, operation, maintenance and service manuals and printed instructions and parts lists for all materials and equipment, where such printed matter is regularly available from the manufacturer. This includes, but is not limited to, such service manuals as may be sold by the manufacturer covering the operation and maintenance of the manufacturer's items, and complete replacement parts list sufficiently detailed for parts replacement ordering to the manufacturer.

Equipment Nameplate Data

A typewritten list of all mechanical and electrical equipment showing all equipment nameplate

data exactly. Identify equipment by means of names, symbols, and numbers used in the Contract Documents.

System Operating Instructions

Type written instructions covering operation of the entire system as installed (not duplicating manufacturers' instructions for operating individual components). Include schematic flow and control diagrams as appropriate and show or list system valves, control-elements, and equipment components using identification symbols and show proper settings for valves, controls and switches.

System Maintenance Instructions

Type written instructions covering routine maintenance of the system. List each item of equipment requiring inspection, lubrication or service and briefly describe such maintenance, including types of lubricants and frequency of service. It is not intended that these instructions duplicate manufacturers' detailed instructions. Give name, address and phone number of nearest firm authorized or qualified to service equipment or provide parts.

Wall Mounted Data

Frame one set of typewritten system instructions and diagrams as required under Paragraphs 3) and 4) above, covered with glass and mount in locations as directed by the Owner's Representative.

INSTRUCTION OF THE DISTRICT'S PERSONNEL BY CONTRACTOR

After Work under this Contract is completed, tested and prior to acceptance by the Owner and not less than five (5) days after submittal of the Operation and Maintenance Data required in the paragraph above, operate all systems during which time a qualified factory trained representative familiar with the items installed shall instruct and supervise the Owner's personnel in the operation and maintenance of the equipment and systems.

Any instructions from manufacturers' representatives required under other Sections of the Specifications shall be conducted during this period. This instruction period shall be conducted after completion of all piping and equipment labeling periods through the Owner's Representative.

Contractor shall make all arrangements and notices for operation and instruction periods through the Owner's Representative.

This one (1) day instruction period is in addition and subsequent to any period of operation, testing and adjustment called for elsewhere in the Specifications.

FINAL CLEANING

The Contractor shall provide final cleaning of the Work. The Contractor shall employ experienced workers or professional cleaners for final cleaning. The Contractor shall clean each surface or unit of Work to the condition expected from a normal, commercial building cleaning and maintenance program.

The Contractor shall comply with the manufacturer's instructions for cleaning operations.

The Contractor shall complete the following cleaning operations before requesting the final inspection.

Remove labels which are not required as permanent labels.

Clean transparent materials, including mirrors and glass in doors and windows, to a polished condition. Remove putty and other substances that are noticeable as vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

Clean exposed exterior and interim hard-surfaced finishes to a dust-free condition, free of dust, stains, films and similar noticeable distracting substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

Wipe surfaces of mechanical and electrical equipment clean. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.

Clean the Project site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas to a broom clean condition; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

Clean plumbing fixtures to a sanitary condition, vacuum and wipe inside of all electrical panels and cabinet work, clean light fixtures and lamps, clean permanent filters and replace disposable filters of units operated during construction; in addition, clean ducts, blowers and coils when units have been operated without filters during construction.

Clean roofs, gutters, downspouts and drainage systems.

REMOVAL OF TEMPORARY FACILITIES

At the completion of the Work, the Contractor shall remove from the premises all tools, appliances, materials, debris, scaffolding, temporary structures, temporary construction for which the Contractor has been responsible.

At the completion of the Work, the Contractor shall remove or cap all temporary utility lines as directed by the Owner's Representative.

At the completion of the Work, the Contractor shall remove all erosion control fencing, straw waddles, inlet protection and wood stakes associated with erosion control if protection measures are deemed no longer necessary by the Owner.

END OF DOCUMENT

6-J DISPUTE RESOLUTION PROCEDURES

It is the intent of this Contract that disputes regarding the Contract be resolved promptly and fairly between the Owner Representative and Contractor. However, it is recognized that some disputes will require detailed investigation and review by one or both parties before a determination and resolution can be reached. For the protection of the rights of both the Contractor and Owner the following provisions apply to the resolution of disputes.

Contractor shall provide verbal or written notice of disputed or potentially disputed work to the Owner Representative's attention prior to the commencement of and sufficiently in advance of performing the disputed work to allow the Owner Representative initial review of the disputed work. If there is disagreement subsequent to the initial review, the Contractor shall formally request a Contract Interpretation by the Owner Representative. If the Contractor disagrees with the Owner Representative's decision, the Contractor shall notify the Owner Representative, in writing, of its intention to make a claim. Written notice of claims shall be clearly titled "Notice of Potential Claim". Such Notice of Potential Claim shall state the circumstances and the reasons for the claim and the amount of the claim within ten (10) days after the date that the claim arises.

In proceeding with a disputed portion of the Work, the Contractor shall keep accurate records of all costs, including a summary of the hours and classification of equipment and labor utilized on the disputed work, as well as a summary of any materials or any specialized services which are used. Such information shall be submitted to the Owner Representative on a daily basis, receipt of which shall not be construed as an authorization for or acceptance of the disputed work.

The Contractor shall submit to the Owner Representative its costs incurred for the claimed matter within five (5) days after request for said information is requested by the Owner Representative. Claims shall be made in itemized detail and should the Owner Representative be dissatisfied with the format or detail of presentation, upon request for more or different information, the Contractor will promptly comply, to the satisfaction of the Owner Representative. If the additional costs are in any respect not knowable with certainty, they shall be estimated as best can be done. The Owner Representative shall have the right as provided to review the Contractor's records pertaining to a submitted claim. In case the claim is found to be just, it shall be allowed and paid for through a Change Order.

From time to time the Contractor may request or the Owner Representative may call a special meeting to discuss outstanding claims should it deem this a means of possible help in the resolution of the claim. The Contractor shall cooperate and attend prepared to discuss its

claims, making available the personnel, subcontractors and suppliers necessary for resolution, and all documents which may reasonably be requested by the Owner Representative.

Public Contract Code Section 9204

The contractor is hereby informed that the Public Contract Code Sections 9204 provides:

The Legislature finds and declares that it is in the best interests of the state and its citizens to ensure that all construction business performed on a public works project in the state that is complete and not in dispute is paid in full and in a timely manner.

Notwithstanding any other law, including, but not limited to, Article 7.1 (commencing with Section 10240) of Chapter 1 of Part 2, Chapter 10 (commencing with Section 19100) of Part 2, and Article 1.5 (commencing with Section 20104) of Chapter 1 of Part 3, this section shall apply to any claim by a contractor in connection with a public works project.

For purposes of this section: "Claim" means a separate demand by a contractor sent by registered mail or certified mail with return receipt requested, for one or more of the following:

A time extension, including, without limitation, for relief from damages or penalties for delay assessed by a public entity under a contract for a public works project.

Payment by the public entity of money or damages arising from work done by, or on behalf of, the contractor pursuant to the contract for a public works project and payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled.

Payment of an amount that is disputed by the public entity.

"Contractor" means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who has entered into a direct contract with a public entity for a public works project.

"Public entity" means, without limitation, except as provided in subparagraph (B), a state agency, department, office, division, bureau, board, or commission, the California State University, the University of California, a city, including a charter city, county, including a charter county, city and county, including a charter city and county, district, special district, public authority, political subdivision, public corporation, or nonprofit transit corporation wholly owned by a public agency and formed to carry out the purposes of the public agency.

"Public works project" means the erection, construction, alteration, repair, or improvement of any public structure, building, road, or other public improvement of any kind.

“Subcontractor” means any type of contractor within the meaning of Chapter 9 (commencing with Section 7000) of Division 3 of the Business and Professions Code who either is in direct contract with a contractor or is a lower tier subcontractor.

Upon receipt of a claim pursuant to this section, the public entity to which the claim applies shall conduct a reasonable review of the claim and, within a period not to exceed 45 days, shall provide the claimant a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, a public entity and a contractor may, by mutual agreement, extend the time period provided in this subdivision.

The claimant shall furnish reasonable documentation to support the claim.

If the public entity needs approval from its governing body to provide the claimant a written statement identifying the disputed portion and the undisputed portion of the claim, and the governing body does not meet within the 45 days or within the mutually agreed to extension of time following receipt of a claim sent by registered mail or certified mail, return receipt requested, the public entity shall have up to three days following the next duly publicly noticed meeting of the governing body after the 45-day period, or extension, expires to provide the claimant a written statement identifying the disputed portion and the undisputed portion.

Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. If the public entity fails to issue a written statement, paragraph (3) shall apply.

If the claimant disputes the public entity’s written response, or if the public entity fails to respond to a claim issued pursuant to this section within the time prescribed, the claimant may demand in writing an informal conference to meet and confer for settlement of the issues in dispute. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the public entity shall schedule a meet and confer conference within 30 days for settlement of the dispute.

Within 10 business days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the public entity shall provide the claimant a written statement identifying the portion of the claim that remains in dispute and the portion that is undisputed. Any payment due on an undisputed portion of the claim shall be processed and made within 60 days after the public entity issues its written statement. Any disputed portion of the claim, as identified by the contractor in writing, shall be submitted to nonbinding mediation, with the public entity and the claimant sharing the associated costs equally. The public entity and claimant shall mutually agree to a mediator within 10 business days after the disputed portion of the claim has been identified in writing. If the parties cannot agree upon a

mediator, each party shall select a mediator and those mediators shall select a qualified neutral third party to mediate with regard to the disputed portion of the claim. Each party shall bear the fees and costs charged by its respective mediator in connection with the selection of the neutral mediator. If mediation is unsuccessful, the parts of the claim remaining in dispute shall be subject to applicable procedures outside this section.

For purposes of this section, mediation includes any nonbinding process, including, but not limited to, neutral evaluation or a dispute review board, in which an independent third party or board assists the parties in dispute resolution through negotiation or by issuance of an evaluation. Any mediation utilized shall conform to the timeframes in this section.

Unless otherwise agreed to by the public entity and the contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Section 20104.4 to mediate after litigation has been commenced.

This section does not preclude a public entity from requiring arbitration of disputes under private arbitration or the Public Works Contract Arbitration Program, if mediation under this section does not resolve the parties' dispute.

Failure by the public entity to respond to a claim from a contractor within the time periods described in this subdivision or to otherwise meet the time requirements of this section shall result in the claim being deemed rejected in its entirety. A claim that is denied by reason of the public entity's failure to have responded to a claim, or its failure to otherwise meet the time requirements of this section, shall not constitute an adverse finding with regard to the merits of the claim or the responsibility or qualifications of the claimant.

Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent per annum.

If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against a public entity because privity of contract does not exist, the contractor may present to the public entity a claim on behalf of a subcontractor or lower tier subcontractor. A subcontractor may request in writing, either on his or her own behalf or on behalf of a lower tier subcontractor, that the contractor present a claim for work which was performed by the subcontractor or by a lower tier subcontractor on behalf of the subcontractor. The subcontractor requesting that the claim be presented to the public entity shall furnish reasonable documentation to support the claim. Within 45 days of receipt of this written request, the contractor shall notify the subcontractor in writing as to whether the contractor presented the claim to the public entity and, if the original contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.

The text of this section or a summary of it shall be set forth in the plans or specifications for any public works project that may give rise to a claim under this section.

A waiver of the rights granted by this section is void and contrary to public policy, provided, however, that (1) upon receipt of a claim, the parties may mutually agree to waive, in writing, mediation and proceed directly to the commencement of a civil action or binding arbitration, as applicable; and (2) a public entity may prescribe reasonable change order, claim, and dispute resolution procedures and requirements in addition to the provisions of this section, so long as the contractual provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

This section applies to contracts entered into on or after January 1, 2017.

Nothing in this section shall impose liability upon a public entity that makes loans or grants available through a competitive application process, for the failure of an awardee to meet its contractual obligations.

This section shall remain in effect only until January 1, 2020, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2020, deletes or extends that date.

The Legislature finds and declares that it is of statewide concern to require a charter city, charter county, or charter city and county to follow a prescribed claims resolution process to ensure there are uniform and equitable procurement practices.

If the Commission on State Mandates determines that this act contains costs mandated by the state, reimbursement to local agencies and school districts for those costs shall be made pursuant to Part 7 (commencing with Section 17500) of Division 4 of Title 2 of the Government Code.

END OF DOCUMENT

SECTION 7 PROJECT FORMS

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7-A PRE-BID REQUEST FOR SUBSTITUTION

Proposed Substitution _____

Manufacturer _____

Product (model, pattern, etc.) _____

Reason for proposed substitution _____

☐ The specified item is unavailable (certified letter from manufacturer/supplier attached).☐ Significant Time Reduction Estimated Calendar Day Reduction: _____ Days☐ Significant Cost Reduction Estimated Reduction in Contract Sum: \$ _____

Significant improvement in quality without a change in Contract sum. Provide comparison information and supporting data substantiating the request per

☐ requirements**EFFECTS OF PROPOSED SUBSTITUTION:**Does substitution affect dimensions indicated on Drawings ☐ Yes ☐ NoDoes substitution affect Work of other Sections? ☐ Yes ☐ NoDoes substitution require modifications to design, changes to Drawings, or revisions to specifications to be incorporated into the Project? ☐ Yes ☐ No

Explain any yes answer above _____

Attach list of at least 3 projects where proposed substitution has been used within past 12 months; include name, address, and telephone number of Owner and Architect.

1. _____

2. _____

3. _____

CONTRACTOR'S / BIDDER'S REPRESENTATION:

Undersigned accepts responsibility for coordination of proposed substitution and accepts all additional costs resulting from the incorporation of proposed substitution into the Project.

SUBMITTED BY: _____ DATE: _____

REVIEWED BY _____ DATE: _____

☐ Accepted ☐ Not Accepted ☐ No Action Required ☐ Incomplete ☐ Too Late

COMMENTS

END OF DOCUMENT

7-B PROPOSAL REQUEST

To Contractor: Proposal Request No. _____

Name: _____ Date Issued _____

Address _____

Attention: _____

Project _____

Copy to: _____

The following change is being considered for the Project. Please provide a Cost Proposal for any changes in Contract Sum and/or Contract Time to perform the work described below in accordance with the General Conditions. Cost Proposal shall be submitted on the Owner's form, 7-B PROPOSAL REQUEST of the Contract Documents.

THIS IS NOT A CHANGE ORDER OR A DIRECTION TO PROCEED WITH THE WORK DESCRIBED HEREIN

Description of Work Requested:**Subject:****Contract****Reference:****The Owner request your Cost Proposal in time and money to:****Attachment:****Project Manager:** _____ **Date:** _____

END OF DOCUMENT

7-C SUBMITTAL TRANSMITTAL

Submittal Number: _____

SUBMITTAL

<u>Specification Section</u>	<u>Article/Paragraph</u>	<u>Description:</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____

The following supporting information is attached:

- | | | |
|---|---|--|
| <input type="checkbox"/> Product Submittal | <input type="checkbox"/> Shop Drawings | <input type="checkbox"/> Schedules (Contract Time) |
| <input type="checkbox"/> Certified Test Results | <input type="checkbox"/> Calculations | <input type="checkbox"/> Color Selection Charts |
| <input type="checkbox"/> Product/Material | <input type="checkbox"/> Manufacturer's Recommendations | |
- Samples
- ☐ Other: _____

Total Number of Copies Submitted

_____ Number of copies to returned to the Contractor.

_____ Original Transparency (Shop Drawings Only).

_____ Opaque Reproductions/Non-Reproducible Submittal.

_____ (District's Project Files, Construction Manager's File, Architect's File, Inspector of Record's File)

_____ Total Number of Copies Submitted.

Specified Item: Yes: ☐ No: ☐ (complete *Request for Substitution Information* below)

As the Contractor for this Project, we have thoroughly checked this submittal and ascertained that this submittal complies in detail with the Contract Documents. Prior to submission, we have reviewed, marked-up as appropriate, and stamped this submittal. The submittal clearly shows that we have clearly reviewed this submittal for conformance with the requirements of the Contract Documents and for coordination with other Sections. We have determined and verified; field measurements, field construction criteria, catalog numbers and similar data, conformance with Contract Documents.

Contractor_____
Date

END OF DOCUMENT

7-D CHANGE ORDER REQUEST*(Reference Contract Administration 6-C Modification Procedures)*

Cost Proposal #: _____

Date Submitted: _____

Project: _____

Scope of Change: _____

Adjustment of Contract Time: *(Include justification based upon the Contract Schedule)* _____Adjustment of the Contract Sum: *Total Additional Cost from Cost Proposal Breakdown* _____**Instructions:**

Complete this form by providing (a) all information required above, (b) the amount and justification based upon the Contract Schedule for any proposed adjustment of Contract Time, (c) the proposed adjustment of Contract Sum, and (d) the attached Cost Proposal Breakdown.

Attach detailed cost breakdowns for all materials, wages and salaries, and Fringe Benefits and Payroll Taxes.

The Contractor Fee shall be computed on the Cost of Extra Work only; and shall constitute full compensation for all costs and expenses related to the subject change and not enumerated in the Cost Proposal Breakdown, including overhead and profit.

The mark-up for all overhead (including home and field office overhead), general conditions costs and profit, shall not exceed the percentage of allowable direct actual costs for performance of the Change as set forth below. Contractor Fee shall be computed as follows:

For the portion of any Change performed by Subcontractors of any tier, the percentage mark-up on allowable actual direct labor and materials costs incurred by Subcontractors of any tier shall be Twelve Percent (12%).

For the portion of any Change performed by a Subcontractor of any tier, the Contractor may add an amount equal to Five Percent (5%) of the allowable actual direct labor and materials costs of Subcontractors performing the Change.

For the portion of any Change performed by the Contractor's own forces, the mark-up on the allowable actual direct labor and materials costs of such portion of a Change shall be Fifteen Percent (15%).

PREPARED BY:

REVIEWED AND RECOMMENDED BY:

(Contractor)_____
(Owner's Representative)

Title: _____

Title: _____

Date: _____

Date: _____

ACTUAL COSTS	(1)	(2)	(3)	(4)
	Contractor	1st Tier Subs	2nd & Lower Tier Subs	Total
1. Straight Time Wages – Labor				
2. Overtime Wages – Labor				
3. Straight. Time Wages/Salaries Supervisory Personnel				
4. Over Time Wages/Salaries – Supervisory Personnel				
5. Fringe Benefits and Payroll Taxes				
6. Materials				
7. Sales Taxes				
8. Rental Charges				
9. Royalties				
10. Permits				
11. Utilities				
Subtotal Cost of Extra Work (sum lines 1-11)				
OVERHEAD, GENERAL CONDITIONS & PROFIT				
Contractor Fee				
Subcontractor Fee (12% of line 12, col. 2 and col. 3.)				
Contractor Fee for Subcontractor and Subcontractor work (5% line 12 col. 3.)				
Total Subcontractor and Subcontractor Work (Sum of lines 12, col.2 and 3)				
Contractor Fee for Subcontractor and Subcontractor Work. (5% of the Total Subcontractor and Sub-Subcontractor Work)				
SUBTOTAL ADDITIONAL COST (Sum of lines 12 and 13a-13d)				
Insurance				
Bonds				
TOTAL ADDITIONAL COST (Sum of lines 14 - 16)				

END OF DOCUMENT

7-E FIELD ORDER

Scotts Valley Water District

Field Order Number: _____

Project: _____

Date: _____

FIELD ORDER

This form to be used only for emergency instructions to the Contractor where time required for preparation and execution of a formal Change Order would result in delay or stoppage of the work. This Field Order is issued as per the requirements of the Contract Documents. A Change Order will supersede this Field Order. The Change Order will include the scope of the change in the Work and any actual adjustments of the Contract sum and the Contract time.

To the Contractor: _____

Reference: _____

Subject: _____

You are hereby authorized and instructed to effect the following modifications in your Contract for the above project:

Estimated Adjustment to Contract Sum: _____

Estimated Adjustment to Contract Time: _____ calendar days

To be used where agreed cost or credit cannot be immediately determined. The final agreed amount shall not be more than the maximum cost nor less than the minimum credit noted above.

Owner's Representative_____
Date_____
Contractor_____
Date_____
District_____
Date

7-F CHANGE ORDER**Scotts Valley Water District**

Change Order No.: _____

Project: _____

Date: _____

To Contractor:

Description of Change: You are hereby authorized to make changes in the Work as described in the following detail sheets and summaries.

Summary of Contract Sum:

Original Contract Sum:	\$ _____
Prior Adjustments:	\$ _____
Contract Sum Prior to this Change:	\$ _____
Adjustments for this Change:	\$ _____
Revised Contract Sum:	\$ _____

Summary of Contract Time:

Original Contract Time:	(Calendar days) Date	_____
Prior Adjustments:	(Calendar days) Date	_____
Contract Time Prior to this Change:	(Calendar days) Date	_____
Adjustments for this Change:	(Calendar days) Date	_____
Revised Contract Time:	(Calendar days) Date	_____

The Contractor waives any claim for further adjustments of the Contract sum and Contract time related to items contained in the Change Order. This Change Order is complete accord and satisfaction for all items included in this Change Order. Also refer to the General Conditions.

The foregoing adjustment of the Contract Price and the Contract Time for the changes noted in this Change Order (the "Changes") represents the full and complete adjustment of the Contract Price and the Contract Time due the Contractor for providing and completing such Changes, including without limitation: (i) all costs (whether direct or indirect) for labor, equipment, materials, tools, supplies and/or services; (ii) all general and administrative overhead costs (including without limitation, home office, field office and Site general conditions costs) and profit; and (iii) all impacts, delays, disruptions, interferences, or hindrances in providing and completing the Changes. The Contractor waives all rights, including without limitation those arising under Civil Code Section 1542, for any other adjustment of the Contract Price or the Contract Time on account of this Change Order or the performance and completion of the Changes.

Accepted by the Contractor,

Contractor

Name

Date

Reviewed and Recommended for Approval

Name

Date

Reviewed and Recommended for District
Approval

Name

Date

Attachments:

Distribution:

7-G ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

California Public Contract Code §22300

THIS ESCROW AGREEMENT ("Escrow Agreement") is made and entered into this Day of _____, 20____ by and between Scotts Valley Water District ("Owner") whose address is 2 Civic Center Drive, Scotts Valley, CA _____ NAME OF CONTRACTOR 95066

("Contractor"), whose place of business is located _____ CONTRACTOR'S ADDRESS at: _____

, and Owner, as escrow agent **OR** _____ NAME OF BANK, a state or federally chartered bank in the State of California, whose place of business is located _____

at: _____ BANK ADDRESS ("Escrow Agent")

For the consideration hereinafter set forth, Owner, Contractor and Escrow Agent agree as follows:

1. Pursuant to California Public Contract Code §22300, Contractor has the option to deposit securities with Escrow Agent as a substitute for retention earnings required to be withheld by Owner pursuant to the Contract entered into between Owner and Contractor for _____ PROJECT NAME located at: _____ PROJECT ADDRESS in the amount of \$ _____ dated _____ DATE (the "Contract"). Alternatively, on written request of Contractor, Owner shall make payments of the retention earnings directly to Escrow Agent. When Contractor deposits the securities as a substitute for Contract earnings, Escrow Agent shall notify Owner within ten days of the deposit. The market value of the securities at the time of substitution shall be at _____ Least equal to the cash amount then required to be withheld as retention under terms of Contract between Owner and Contractor. Securities shall be held in name of _____ and shall designate Contractor as the beneficial owner.
2. Owner shall make progress payments to Contractor for those funds which otherwise would be withheld from progress payments pursuant to Contract provisions, provided that Escrow Agent holds securities in form and amount specified in Paragraph 1 of this Document 00 6290.
3. When Owner makes payment(s) of retention earned directly to Escrow Agent, Escrow Agent shall hold said payment(s) for the benefit of Contractor until the time that the escrow created under this Escrow Agreement is terminated. Contractor may direct the investment of the payments into securities. All terms and conditions of this Escrow Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when Owner pays Escrow Agent directly.

4. Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account, and all expenses of Owner. Such expenses and payment terms shall be determined by Owner, Contractor, and Escrow Agent.
5. Interest earned on securities or money market accounts held in escrow and all interest earned on that interest shall be for sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to Owner.
6. Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from Owner to Escrow Agent that Owner consents to withdrawal of amount sought to be withdrawn by Contractor.
7. Owner shall have the right to draw upon the securities in event of default by Contractor. Upon seven Days written notice to Escrow Agent from Owner of the default, Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by Owner.
8. Upon receipt of written notification from Owner certifying that the Contract is final and complete, and that Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.
9. Escrow Agent shall rely on written notifications from Owner and Contractor pursuant to Paragraphs 5 through 8, inclusive, of this Document 00 6290 and Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of securities and interest as set forth.
10. Names of persons who are authorized to give written notice or to receive written notice on behalf of Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

ON BEHALF OF OWNER:

Title

Name

Signature

Address

City/State/Zip Code**ON BEHALF OF CONTRACTOR:**

Title

Name

Signature

Address

City/State/Zip Code**ON BEHALF OF ESCROW AGENT:**

Title:

Name:

Signature:

Address:

City/State/Zip Code

IN WITNESS WHEREOF, the parties have executed this Escrow Agreement by their proper officers on the date first set forth above.

OWNER:

Title

Name

Signature**CONTRACTOR**

Title

Name

Signature**ATTEST:**

Signature

Secretary**ESCROW AGENT:**

Title

Print Name

Signature**REVIEWED AS TO FORM:**

Counsel for Owner

Print Name

Date

At the time the Escrow Account is opened, Owner and Contractor shall deliver to Escrow Agent a fully executed counterpart of this Document 00 6290.

END OF DOCUMENT