

# LOWER TULE RIVER IRRIGATION DISTRICT

**CONTRACT DOCUMENTS**

**AND**

**SPECIFICATIONS**

**FOR THE**

**TIPTON PIPELINE**

**OCTOBER 2024**

**Prepared for:**

**LOWER TULE RIVER IRRIGATION DISTRICT  
357 E Olive Ave  
Tipton, California 93272**

**Prepared by:**

**PROVOST & PRITCHARD  
CONSULTING GROUP**

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LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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**SECTION 00 11 13**  
**REQUEST FOR BIDS**

In general, the Work consists of the construction of a 24-inch diameter pipeline, metering stand and outlet into an existing recharge basin.

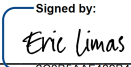
1. Sealed bids will be received by the Lower Tule River Irrigation District prior **to 2:00 p.m. (local time) on November 8, 2024**, at Lower Tule River Irrigation District, 357 E Olive Ave, Tipton, CA 93272, and following said deadline all bids will be publicly opened and read. Bids shall be submitted in a sealed envelope with the name of the bidder, the name of the project and the statement **“Do Not Open Until the Time of Bid Opening.”** Bids received after said deadline will be returned unopened to the bidder.
2. A non-mandatory **pre-bid meeting and project site tour** will be held on **Tuesday, October 24, 2024 and time** beginning at the Northeast corner of the basin located at the corner of Avenue 152 and Callison Rd. location (Lat/Long 36°04'01.3"N 119°18'14.6"W). Contractors shall personally examine the project site prior to bidding.
3. Bidding Documents may be obtained from Lower Tule River Irrigation District. Interested parties must contact Lower Tule River Irrigation District (559) 686-4716 to register as a plan holder and receive the documents. Bidding Documents may be examined at the following locations:
  - a. Lower Tule River Irrigation District, 357 E. Olive Avenue, Tipton CA 93272 Provost & Pritchard Consulting Group, 400 E Main Street, Suite 300, Visalia, CA 93291.
4. Bidding Documents may be obtained from Lower Tule River Irrigation District. Only registered plan holders are eligible to bid on this project. Bids received by contractors not on the plan holder list will be rejected and will not be opened. The official plan holder list will also be used to distribute addenda (if any), RFI responses, and information on how to join the pre-bid meeting and the public opening of bids. In order to be placed on the plan holder list, contractors must contact Lower Tule River Irrigation District (559) 686-4716 to register as a plan holder and receive the documents.
5. Prevailing Wage Rates: Pursuant to Section 1770, California Labor Code, the successful Bidder shall pay not less than the prevailing rate of per diem wages as determined by the Director of California Department of Industrial Relations. A copy of such prevailing rate is on file at the offices of the Lower Tule River Irrigation District, which copy will be made available for examination during business hours to any party on request: Prevailing wage rate information is also available on the internet at the following website address:  
<http://www.dir.ca.gov/dlsr/PWD>.
6. This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations. No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.
7. Bidders shall furnish a Bid Security with their Bidder's Proposal in the amount of 10% of the base bid amount.
8. **The Engineer's opinion of probable construction cost is: \$623,000**

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- 9. OWNER reserves the right after opening Bids to reject any or all Bids, to waive any informality or non-responsiveness in a Bid, or to make award to the lowest responsive, responsible Bidder and reject all other Bids, as it may best serve the interest of the OWNER.
- 10. Contractor's License Classification: In accordance with the provisions of California Public Contract Code, Section 3300, Lower Tule River Irrigation District has determined that bidder shall possess a valid **Class A Contractor's License** issued by the State of California at the time of Bid opening and for the duration of the contract. Failure to possess the specified licenses shall render the Bid as non-responsive and shall act as a bar to award of the contract to any bidder not possessing said license at the time of Bid opening. The Contractors' State License Board may be contacted at 9821 Business Park, Sacramento, CA 95827; PO Box 26000, Sacramento, CA 95826; (800) 321-2752.

BY THE ORDER OF THE BOARD  
OF LOWER TULE RIVER IRRIGATION DISTRICT

Signed by:  
  
 \_\_\_\_\_  
 Eric Limas, General Manager

\_\_\_\_\_  
 (Publication Date)  
 Date

**END SECTION**

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**SECTION 00 21 13**  
**INSTRUCTIONS TO BIDDERS**

1. The Contract Documents include the Contract Agreement, the Request For Bids, the Instructions to Bidders, the General Conditions, Supplementary General Conditions, Bidding and Contract Documents - Division 0, General Requirements - Division 1, Technical Specifications - Division 2, the Bidder's Proposal as accepted (including the Bid Schedule), the Indemnity Agreement, the Non-collusion Affidavit, the required Bonds, Wage Scale (prevailing wages) the Plans, Profiles and Drawings, and any Addenda or Change Orders. Bidders must examine each of the Contract Documents, must visit the location of the Work and inform themselves of the conditions and make their own estimates of the facilities and difficulties attending the execution of the Work.
2. All Bids must be presented under sealed cover on the blank proposal form attached hereto. Bids shall be submitted in a sealed envelope with the name of the bidder, the name of the project and the statement **“Do Not Open Until The Time of Bid Opening.”** Bids are required for the entire work described herein. Bids will be compared on the basis of the total of bid items in the Bid Schedule. Award, if made, will be based upon the lowest responsible bid submitted.
3. The party to whom the Contract is awarded must possess a Class A Contractor's license valid in the State of California.
4. The Bidder shall include all of the items listed in Section 00 43 93 – Bidder's Checklist in the Bid.
5. Each Bid must be accompanied by a Bid Security payable to the Owner for ten percent (10%) of the total amount of the base Bid. A cashier's check made payable to the Owner, a certified check made payable to the Owner, or cash in the appropriate amount may be used in lieu of a Bid Bond. In no event will security submitted by unsuccessful Bidders be held by the Owner for more than 60 days from the time of award of the Contract. The Bid Security of the successful Bidder will be retained until the Performance Bond and the Payment Bond have been executed and approved, after which the Bid Security will be returned.
6. A Performance Bond and a Payment Bond in the amount of One Hundred percent (100%) each of the Contract Price, with a Corporate Surety approved by the Owner and the Engineer, will be required for the faithful performance of the Contract. The Bidder shall state in the proposal the name and address of the Surety or Sureties, with Certificate Numbers, who will sign the Bonds in case the Contract is awarded to him.
7. The party to whom the Contract is awarded will be required to execute the Contract Agreement, Performance Bond and Payment Bond within ten (10) calendar days from the date when the written notice of the award of the Contract is mailed to the Bidder at the address given by him. In case of failure to do so, the Owner may at its option, consider that the Bidder has abandoned the Contract, in which case, the Bid Security accompanying the proposal shall become the property of the Owner and award may be made to another party. Corporations must furnish a certificate attesting to corporate existence and authority of officers to sign contracts and other documents.

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8. **The Contractor shall begin Work within fourteen (14) calendar days** after receiving the Notice to Proceed by the Owner. The Contractor shall **complete all Work within ninety (90) calendar days following the date of the Notice to Proceed**. Time is of the essence and time of completion as specified will be enforced.
9. The Contractor's attention is called to Section 00 52 15, addressing Liquidated Damages. It is agreed that the Contractor shall be liable for and shall pay to the Owner, as liquidated damages and not as a penalty, the listed sum per day for each calendar day of delay in completion of the Work from the date of completion as specified herein or in any written extension of time granted by the Owner. Liquidated damages will be deducted from final payments.
10. Before the award of the Contract, any Bidder may be required to furnish evidence satisfactory to the Owner and to the Engineer of the necessary facilities, ability, and pecuniary resources to fulfill the conditions of the Contract.
11. Prior to signing the Contract, the successful Bidder shall submit, on a form acceptable to the Owner and Engineer, an overall construction schedule for the project. This schedule shall start with the proposed date of signing the Contract, and the completion date shall be no later than the date specified in the Contract.
12. Bidders must satisfy themselves by personal examination of the location of the proposed work, and by examination of the Plans and Specifications as to the requirements of the Work and the accuracy of the estimate of the quantities of the work to be done, and shall not at any time after the submission of the Bid dispute or complain of such estimate nor assert that there was any misunderstanding in regard to the nature or amount of work to be done.
13. The Contract and the Specifications contain the provisions required for the construction of the project. No information obtained from any officer, agent, consultant, or employee of the Owner on any such matters shall in any way affect the risk or obligation assumed by the successful Bidder or relieve him from fulfilling any of the conditions of the Contract.
14. Proposals which are incomplete, unbalanced, conditional or obscure or which contain additions not called for, erasures, alterations or irregularities of any kind or which do not comply with the Notice to Bidders and Instruction to Bidders may be rejected at the option of the Owner.
15. A Bidder may withdraw any proposal he has submitted at any time prior to the hour set for the closing of the Bids provided the request for withdrawal is signed in a manner identical with the proposal being withdrawn. No withdrawal or modification will be permitted after the hour designated for closing the Bids. The Bidder's Proposal shall then hold firm for sixty (60) days to enable the Owner to complete pre-construction arrangements prior to issuing any Notice of Award.
16. Computation of quantities that will be the basis for payment estimates, both monthly and final, will be made by the Engineer.
17. If any person contemplating submitting a Bid for the proposed Contract is in doubt as to the true meaning of any part of the Plans and Specifications or other Contract Documents, or finds discrepancies in, or omissions from the Plans and Specifications, he may submit to the Owner a written Request For Interpretation or correction thereof. The person submitting the

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request will be responsible for its prompt delivery. Any interpretation or correction of the Contract Documents will be made only by Addendum duly issued and a copy of such Addendum will be mailed or delivered to each Bidder receiving a set of such Contract Documents. The Owner will not be responsible for any other explanations or interpretations of the Contract Documents. No oral interpretations of any provision in the Contract Documents will be made to any Bidder.

18. No substitution of subcontractors by the Bidder will be allowed or permitted except in accordance with the provisions of Public Contract Code Sections 4107 and 4107.5.
19. The award of the contract, if made, will be within **ninety (90) calendar days** after the opening of bids, and satisfactory submittal of materials required prior to the formal award.
20. The Lower Tule River Irrigation District reserves the right to accept or reject any or all bids, to evaluate the bids submitted, and to award the Contract according to the proposal which best serves the interests of the Lower Tule River Irrigation District.

**END SECTION**

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**INSTRUCTIONS TO BIDDERS**  
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**SECTION 00 41 43**  
**BIDDER'S PROPOSAL**

**Lower Tule River Irrigation District is** hereinafter called the Owner.

**BIDDER:** \_\_\_\_\_

The work to be done and referred to herein is in Tipton and in Tulare County, State of California. It is shown on a set of Plans, entitled: "Tipton Pipeline" and is to be constructed in accordance with the Project Specifications and contract documents attached hereto by reference.

In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

- A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents and the following Addenda, receipt of all which is hereby acknowledged.

<b>Addendum No.</b>	<b>Addendum Date</b>
_____	_____
_____	_____
_____	_____
_____	_____

- B. Bidder has visited the Site and became familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

The undersigned, as Bidder, declares that the only persons, or parties interested in this proposal as principals are those named herein, that this proposal is made without collusion with any other person, firm or corporation; that he has carefully examined the location of the proposed work, the Plans and Specifications referred to, the referenced proposed contract, and the Bidder proposes and agrees that, if this proposal is accepted, he will contract with the Owner to provide all necessary machinery, tools, apparatus and other means of construction, and to do all the work and furnish all the materials specified in the contract in the manner and time therein prescribed, and according to the requirements as therein set forth, and that he will take in full payment therefor the following unit prices as set forth in the Bid Schedule below.

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00 41 43-1

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**LOWER TULE RIVER IRRIGATION DISTRICT  
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**BID SCHEDULE**

Item	Description	Quantity	Unit	Unit Price	Total
<b>GENERAL</b>					
1.	Mobilization/Demobilization, Bonds, Insurance, and Permits	1	LS	\$ _____	\$ _____
2.	Worker Protection	1	LS	\$ _____	\$ _____
3.	Miscellaneous Facilities and Operations	1	LS	\$ _____	\$ _____
4.	SWPPP Preparation and Implementation	1	LS	\$ _____	\$ _____
5.	Dust Control	1	LS	\$ _____	\$ _____
6.	Compaction and Materials Testing	1	LS	\$ _____	\$ _____
7.	Traffic Control	1	LS	\$ _____	\$ _____
<b>Tipton Pipeline</b>					
8.	Turnout Installation into Headwall	1	LS	\$ _____	\$ _____
9.	Furnish and Install 24-Inch PIP SDR 41 100 PSI	2320	LF	\$ _____	\$ _____
10.	Furnish and Install Flow meter and Vault	1	LS	\$ _____	\$ _____
11.	Construct Outlet Structure	1	LS	\$ _____	\$ _____
12.	Callison Road Crossing Demolition and Resurfacing	1	LS	\$ _____	\$ _____
<b>TOTAL BASE BID</b>					\$ _____

BIDDER'S PROPOSAL  
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Indicate the percentage of the dollar amount of the Work that the Bidder proposes to perform with its own forces: \_\_\_\_\_%. Less than 50% shall render the bid nonresponsive.

This proposal must be accompanied by a Bid Security in the form of Cash, Certified Check or Bid Bond in an amount equal to at least ten percent (10%) of the amount of the base bid.  
The names of all persons interested in the foregoing proposals as principals are as follows:

**IMPORTANT NOTICE:** If Bidder or other interested person is a corporation, state legal name of corporation, also names of the president, secretary, treasurer and manager thereof; if a co-partnership, state true name of firm, also names of all individual co-partners composing firm; if bidder or other interested person is an individual, state first and last name in full.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Licensed in accordance with an act providing for the registration of Contractors,

Class \_\_\_\_\_ License No. \_\_\_\_\_

Bidder's DIR Registration Number: \_\_\_\_\_

By \_\_\_\_\_ Dated \_\_\_\_\_  
Signature of Bidder

**NOTE:** If Bidder is a corporation, the legal name of the corporation shall be set forth above together with the seal and signature of the officer or officers authorized to sign contracts on behalf of the corporation; if Bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his signature shall be placed above. If signature is by an agent, other than an officer of a corporation or member of a partnership, a Power of Attorney must be on file with the Owner prior to opening bids or submitted with the bid; otherwise, the bid will be disregarded as irregular and unauthorized.

**BIDDER'S INFORMATION:**

BUSINESS ADDRESS: \_\_\_\_\_

MAILING ADDRESS: \_\_\_\_\_

BUSINESS PHONE: \_\_\_\_\_

CONTACT NAME: \_\_\_\_\_

CONTACT EMAIL: \_\_\_\_\_

BIDDER'S PROPOSAL  
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**Basis of Comparison of Bids:** Bids will be compared on the basis of the Base Bid amount exclusive of alternates. The project will be awarded to the lowest responsible, responsive bidder.

Bids are required for the entire work. The Bidder shall set forth for each item of work, in clearly legible figures, total for the item in the respective spaces provided for this purpose. If the total cost of any item, or the total bid, is inconsistent with the Unit Price, or the sum of the Unit Prices, the sum of the extended Unit Prices shall prevail.

**Abandonment of the Contract:** If this proposal shall be accepted and the undersigned Bidder shall fail to contract, as aforesaid, and to give the required Performance and Payment bonds in the sums to be determined in accordance with the Specifications, with surety as required by the Specifications, within ten (10) days not including Sundays and legal holidays, after the Bidder has received notice of award of the contract, the Owner, at its option, may determine that the Bidder has abandoned the contract, and thereupon this proposal and the acceptance thereof may be declared be null and void, and the forfeiture of such Security accompanying this proposal shall operate and said Security shall be the property of the Owner.

**ABBREVIATIONS USED IN ENGINEER'S ESTIMATE AND PROPOSAL SHEETS**

CF	-	Cubic Foot (Feet)	SACK(S)	-	Sack(s)
CY	-	Cubic Yard(s)	STAYD	-	Station Yard(s)
EA	-	Each	SF	-	Square Foot (Feet)
LB(s)	-	Pound(s)	SY	-	Square Yard(s)
LF	-	Linear Foot (Feet)	TN	-	Ton(s)
LS	-	Lump Sum	MGAL	-	Million Gallon(s)
(F)	-	Final Pay Quantity*	(S)	-	Specialty Item
(S-F)	-	Specialty Item and Final Pay Quantity*	(F&I)	-	Furnish and Install

\*Bid Items noted as being Final Pay Quantity will be handled in accordance with Section 01 20 00 – Measurement & Payment.

**END SECTION**

BIDDER'S PROPOSAL  
00 41 43-4



LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 00 43 13**  
**BID BOND**

KNOW ALL MEN BY THESE PRESENTS, that we, the undersigned,

\_\_\_\_\_

as Principal, and \_\_\_\_\_ as Surety, are hereby held and

firmly bound unto Lower Tule River Irrigation District, as OWNER, in the penal sum of

\_\_\_\_\_

\_\_\_\_\_ Dollars (\$\_\_\_\_\_), for the payment of which, well and

truly to be made, we hereby jointly and severally bind ourselves, successors and assigns.

Signed, this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

The Condition of the above obligation is such that whereas the Principal has submitted to a certain BID attached hereto and hereby made a part hereof to enter into a contract in writing, for the Tipton Pipeline;

NOW, THEREFORE,

- (a) If said bid shall be rejected, or
- (b) If said bid shall be accepted and the Principal shall execute and deliver a contract in the Form of Contract attached hereto (properly completed in accordance with said bid) and shall furnish bonds for his faithful performance of said contract and for the payment of all persons performing labor or furnishing materials in connection therewith, and shall in all other respects perform the agreement created by the acceptance of said bid, then this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall, in no event, exceed the penal amount of this obligation as herein stated.

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The Surety, for value received, hereby stipulates and agrees that the obligations of said Surety and its bond shall in no way be impaired or affected by any extension of the time within which the Owner may accept such bid; and said Surety does hereby waive notice of any such extension.

IN WITNESS WHEREOF, the Principal and the Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, the day and year first set forth above.

\_\_\_\_\_  
Principal (L.S.)

\_\_\_\_\_  
Surety

\_\_\_\_\_  
California Surety Number

**IMPORTANT** – Surety companies executing bonds must appear on the Treasury Department’s most current list (Circular 570 as amended) and be authorized to transact business in the state of California.

**END SECTION**

BID BOND  
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**SECTION 00 43 33**  
**MATERIAL SUPPLIERS INFORMATION**

The Bidder shall indicate opposite each item of equipment or material listed below the name of the manufacturer or supplier of the equipment or material proposed to be furnished under the Bid.

	<u>Equipment/Material</u>	<u>Manufacturer/Supplier</u>
1.	<u>Flow Meter</u>	<u></u>
2.	<u>Plastic Irrigation Pipe</u>	<u></u>
3.	<u>Precast Structures</u>	<u></u>
4.	<u>Slide Gate</u>	<u></u>
5.	<u></u>	<u></u>
6.	<u></u>	<u></u>
7.	<u></u>	<u></u>
8.	<u></u>	<u></u>
9.	<u></u>	<u></u>
10.	<u></u>	<u></u>
11.	<u></u>	<u></u>
12.	<u></u>	<u></u>
13.	<u></u>	<u></u>
14.	<u></u>	<u></u>

Awarding of a contract under this bid will not imply approval by the Owner of the manufacturers or suppliers listed by the Bidder. No substitution will be permitted after award of contract unless equipment or material of the listed manufacturer or supplier cannot meet the specifications.

**END SECTION**

MATERIAL SUPPLIERS INFORMATION  
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**MATERIAL SUPPLIERS INFORMATION**  
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**SECTION 00 43 36**  
**LIST OF SUBCONTRACTORS**

The bidder shall hereby designate the names, business addresses, contractor license number, and public works contractor registration number of each subcontractor who will perform work or labor on the Project. Please fill out as completely as possible when submitting your bid. Use subcontractor's business name as registered with the License Board.

1. State the name, location of the place of business, California contractor license number, and public works contractor registration number of each subcontractor licensed by the State who will (i) perform work or labor or render service to the Bidder for the Project contemplated in the Plans and Specifications or (ii) specially fabricate and install a portion of the work or improvement according to the detailed Drawings contained in the Plans and Specifications, in an amount in excess of one-half of one percent of the Bidder's total Bid.
2. State the portion of the Work that will be done by each subcontractor. List only one subcontractor for each portion as defined by the Bid.
3. Work not listed as subcontracted shall be performed by Bidder.
4. Subcontractors may not be substituted without cause. Subcontractor substitution procedure will be in accordance with State Contracts Code Section 4100, et seq.

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_  
 Class \_\_\_\_\_ License No. \_\_\_\_\_  
 DIR Number: \_\_\_\_\_  
 Item No. or Description of Work: \_\_\_\_\_  
 Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_  
 Class \_\_\_\_\_ License No. \_\_\_\_\_  
 DIR Number: \_\_\_\_\_  
 Item No. or Description of Work: \_\_\_\_\_  
 Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_  
 Class \_\_\_\_\_ License No. \_\_\_\_\_  
 DIR Number: \_\_\_\_\_  
 Item No. or Description of Work: \_\_\_\_\_

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_

Class \_\_\_\_\_ License No. \_\_\_\_\_

DIR Number: \_\_\_\_\_

Item No. or Description of Work: \_\_\_\_\_

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_

Class \_\_\_\_\_ License No. \_\_\_\_\_

DIR Number: \_\_\_\_\_

Item No. or Description of Work: \_\_\_\_\_

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_

Class \_\_\_\_\_ License No. \_\_\_\_\_

DIR Number: \_\_\_\_\_

Item No. or Description of Work: \_\_\_\_\_

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_

Class \_\_\_\_\_ License No. \_\_\_\_\_

DIR Number: \_\_\_\_\_

Item No. or Description of Work: \_\_\_\_\_

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_

Class \_\_\_\_\_ License No. \_\_\_\_\_

DIR Number: \_\_\_\_\_

Item No. or Description of Work: \_\_\_\_\_

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

LIST OF SUBCONTRACTORS  
00 43 36-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_

Class \_\_\_\_\_ License No. \_\_\_\_\_

DIR Number: \_\_\_\_\_

Item No. or Description of Work: \_\_\_\_\_

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**SUBCONTRACTOR:**

Business Address: \_\_\_\_\_

Class \_\_\_\_\_ License No. \_\_\_\_\_

DIR Number: \_\_\_\_\_

Item No. or Description of Work: \_\_\_\_\_

Dollar Amount or Percentage of Total Bid: \_\_\_\_\_

**END SECTION**

LIST OF SUBCONTRACTORS  
00 43 36-3

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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LIST OF SUBCONTRACTORS  
00 43 36-4





LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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PRELIMINARY CONSTRUCTION SCHEDULE  
00 43 83-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 43 93  
BIDDER'S CHECKLIST**

**SUBMIT THIS BIDDER'S CHECKLIST WITH YOUR BID DOCUMENTS.**

Bidders shall complete and submit all documents listed in the "REQUIRED" column for bids to be considered responsive.

REQUIRED

1. Section 00 41 43 – Bidder's Proposal
2. Bid Security attached to front of Bidder's Proposal in the form of (check one):
 

<input type="checkbox"/> Certified Check	<input type="checkbox"/> Bidder's Bond (Section 00 43 13)
<input type="checkbox"/> Cashier's Check	<input type="checkbox"/> Cash
3. Section 00 43 33 – Material Suppliers
4. Section 00 43 36 – List of Subcontractors
5. Section 00 43 83 – Preliminary Construction Schedule
6. Section 00 45 13 – Bidder's Qualification Statement
7. Section 00 45 26 – Workers Compensation Certification
8. Section 00 45 51 – Labor and Other Code Requirements Certificate
9. All issued Addenda

**SUBMITTED BY:**

Name of Company \_\_\_\_\_

Contact Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone No. \_\_\_\_\_ Fax No. \_\_\_\_\_

Contractor's License No. \_\_\_\_\_ Class: \_\_\_\_\_

State DIR Registration No. \_\_\_\_\_

Documents required on the checklist but not included with your bid may render your bid non-responsive and ineligible for award. Bids received by the scheduled bid opening time will be opened and publicly read but are subject to verification that all required documents have been submitted.

BIDDER'S CHECKLIST  
00 43 93-1

LOWER TULE RIVER IRRIGATION DISTRICT  
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**END SECTION**

**BIDDER'S CHECKLIST**  
**00 43 93-2**

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 45 13**  
**BIDDER'S QUALIFICATIONS**

**PROJECT: Tipton Pipeline**

**TO: Lower Tule River Irrigation District**

**TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID**

---

(Name of Organization)

---

(Owner, Partner, Corporate Officer (list title), Co-Venturer)

---

(Address and Telephone Number)

**1) EXPERIENCE AND REFERENCES**

List three (3) or more past (or current) projects of similar size and scope to this project by completing the table below (or attaching information required in the table):

<b>REFERENCE #1</b>
<b>Project name:</b>
<b>Owner:</b>
<b>Project location:</b>
<b>Contract amount (\$):</b>
<b>Completion date:</b>
<b>Project description:</b>
<b>Reference contact name and phone number:</b>

**BIDDER'S QUALIFICATIONS**  
**00 45 13-1**

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

<b>REFERENCE #2</b>
<b>Project name:</b>
<b>Owner:</b>
<b>Project location:</b>
<b>Contract amount (\$):</b>
<b>Completion date:</b>
<b>Project description:</b>
<b>Reference contact name and phone number:</b>
<b>REFERENCE #3</b>
<b>Project name:</b>
<b>Owner:</b>
<b>Project location:</b>
<b>Contract amount (\$):</b>
<b>Completion date:</b>
<b>Project description:</b>
<b>Reference contact name and phone number:</b>

BIDDER'S QUALIFICATIONS  
00 45 13-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**2) CONTRACTOR FINANCIAL INFORMATION**

a) List name, address, and phone number of bonding company used by your organization.

b) List name, address, and phone number of a banking institution familiar with your organization.

c) State whether your organization has been subject of bankruptcy, failed business, or failed to complete a contract.

Signed: \_\_\_\_\_

\_\_\_\_\_  
Name

\_\_\_\_\_  
Date

**END SECTION**

BIDDER'S QUALIFICATIONS  
00 45 13-3

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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**BIDDER'S QUALIFICATIONS**  
00 45 13-4



LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 45 25**  
**STATE WAGE DETERMINATION**

**1.1 INSTRUCTIONS:**

The general contractor is required to post the relevant state wage determination on the job site for the project in a conspicuous location available to all workers.

**THE**  
**STATE WAGE DETERMINATION**  
**Department of Industrial Relations Number #####**  
**LOWER TULE RIVER IRRIGATION DISTRICT**  
**TIPTON PIPELINE**  
**TULARE County**  
**CALIFORNIA**

**END SECTION**

**STATE WAGE DETERMINATION**  
**00 45 25-1**

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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STATE WAGE DETERMINATION  
00 45 25-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 45 26**  
**WORKER'S COMPENSATION CERTIFICATION**

STATE OF CALIFORNIA )  
( SS  
COUNTY OF TULARE)

The undersigned is aware of the provisions of Section 3700 of the Labor Code of the State of California which require every employer to be insured against liability of worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and the undersigned will comply with such provisions, and will require all subcontractors to comply with such provisions, before commencing the performance of the work of this Contract.

\_\_\_\_\_  
Date:

\_\_\_\_\_  
Contractor Signature

**END SECTION**

**WORKER'S COMPENSATION CERTIFICATION**  
**00 45 26-1**

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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WORKER'S COMPENSATION CERTIFICATION  
00 45 26-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 45 47**  
**PUBLIC CONTRACT CODE SECTION 10162**  
**QUESTIONNAIRE ON DISQUALIFICATION**  
**(TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID)**

In accordance with Public Contract Code Section 10162, the Bidder shall complete, under penalty of perjury, the following questionnaire:

Has the bidder, any officer of the bidder, or any employee of the bidder who has proprietary interest in the bidder, ever been disqualified, removed, or otherwise prevented from bidding on, or completing a federal, state, or local government project because of a violation of law or a safety regulation?

Yes \_\_\_\_\_ No \_\_\_\_\_

If the answer is Yes, explain the circumstances in the space below:

---

---

---

NOTE: The above Questionnaire is part of the Proposal.

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

By \_\_\_\_\_ Date \_\_\_\_\_  
Signature of Bidder

**END SECTION**

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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PUBLIC CONTRACT CODE SECTION 10162 QUESTIONNAIRE ON DISQUALIFICATION  
00 45 47-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 45 48**  
**PUBLIC CONTRACT SECTION 10232**  
**STATEMENT ON CONTEMPT**

**(TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID)**

In accordance with Public Contract Code Section 10232, the Contractor, hereby states, under penalty of perjury, that no more than one final unappealable finding of contempt of court by a federal court has been issued against the Contractor within the immediately preceding two-year period because the Contractor's failure to comply with an order of a federal court which orders the Contractor to comply with an order of the National Labor Relations Board.

By \_\_\_\_\_                      \_\_\_\_\_  
Signature of Bidder                      Date

**END SECTION**

PUBLIC CONTRACT SECTION 10232 STATEMENT ON CONTEMPT  
00 45 48-1

LOWER TULE RIVER IRRIGATION DISTRICT  
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PUBLIC CONTRACT SECTION 10232 STATEMENT ON CONTEMPT  
00 45 48-2



LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 00 45 51**  
**LABOR COMPLIANCE PROGRAM AND**  
**LABOR AND OTHER CODE REQUIREMENTS CERTIFICATE**

**1 - FEDERAL/STATE WAGE RATE CLAUSES**

Pursuant to the provisions of Part 7 Chapter 1 (beginning with Section 1770) of the California Labor Code, the successful bidder shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations and the Davis-Bacon prevailing rate of per diem wages, 29 CFR 5.5 as determined by the U.S. Department of Labor, Employment Standards Administration. Where the requirements of the State of California Department of Industrial Relations and the Davis-Bacon prevailing rate of per diem wages conflict, the higher of the two will be used. State of California prevailing wage schedules for Tulare County are available from the Department of Industrial Relations - Division of Labor Statistics and Research via the Internet at <http://www.dir.ca.gov/dlsr/PWD>.

The successful bidder intending to use a craft or classification not shown on the prevailing rate determinations may be required to pay the rate of the craft or classification most closely related to it.

Pursuant to the provisions of Labor code section 1773, the Owner has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate of holiday and overtime work in the locality in which the Work is to be performed for each craft, classification or type of worker needed to execute the Work. Copies of the prevailing rate of per diem wages are on file at the Owner's principal office and shall be made available to any interested party on request. The Contractor shall cause a copy of the Director's determination of the prevailing rate of per diem wages to be posted at a prominent place at the site of the Work. The possibility of wage increases is one of the elements to be considered by the Contractor in determining his bid and will not under any circumstances be considered as the basis of claim against the Owner. The Contractor shall comply with Labor Code section 1774 and 1775. In accordance with Labor Code section 1775, the Contractor shall forfeit as a penalty to the Owner not more than \$50 for each Day or portion thereof for each worker paid less than the prevailing rates as determined by the director for the Work or craft in which the worker is employed for any Work or by any subcontractor under the Contractor. The amount of this penalty shall be determined by the Director based on the factors set forth in section 1775. In addition to such penalty, the difference between such prevailing wage rates and the amount paid to each workman for each Day or portion thereof for each workman was paid less than the prevailing wage rate shall be paid to each worker by the Contractor.

**2 - LABOR CODE SECTION 1776**  
**COMPLETE PAYROLL RECORDS; CERTIFIED AND AVAILABLE**

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

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

LABOR COMPLIANCE PROGRAM AND LABOR AND OTHER CODE REQUIREMENTS CERTIFICATE  
00 45 51-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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

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

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

(2) A certified copy of all payroll records enumerated in subdivision (a) shall be made available for inspection or furnished upon request to a representative of the body awarding the contract, the Division of Labor Standards Enforcement, and the Division of Apprenticeship Standards of the Department of Industrial Relations.

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

(c) The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the division. The payroll records may consist of printouts of payroll data that are maintained as computer records, if the printouts contain the same information as the forms provided by the division and the printouts are verified in the manner specified in subdivision (a).

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

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

(f) (1) Notwithstanding any other provision of law, agencies that are included in the Joint Enforcement Strike Force on the Underground Economy established pursuant to Section 329 of

LABOR COMPLIANCE PROGRAM AND LABOR AND OTHER CODE REQUIREMENTS CERTIFICATE  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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the Unemployment Insurance Code and other law enforcement agencies investigating violations of law shall, upon request, be provided nonredacted copies of certified payroll records. Any copies of records or certified payroll made available for inspection and furnished upon request to the public by an agency included in the Joint Enforcement Strike Force on the Underground Economy or to a law enforcement agency investigating a violation of law shall be marked or redacted to prevent disclosure of an individual's name, address, and social security number.

(2) An employer shall not be liable for damages in a civil action for any reasonable act or omission taken in good faith in compliance with this subdivision.

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

(h) The contractor or subcontractor has 10 days in which to comply subsequent to receipt of a written notice requesting the records enumerated in subdivision (a). In the event that the contractor or subcontractor fails to comply within the 10-day period, he or she shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. A contractor is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section.

(i) The body awarding the contract shall cause to be inserted in the contract stipulations to effectuate this section.

(ii) The director shall adopt rules consistent with the California Public Records Act (Chapter 3.5 commencing with Section 6250) of Division 7 of Title 1 of the Government Code) and the Information Practices Act of 1977 (Title 1.8 commencing with Section 1798) of Part 4 of Division 3 of the Civil Code) governing the release of these records, including the establishment of reasonable fees to be charged for reproducing copies of records required by this section.

**3 - LABOR CODE SECTION 1777.5  
EMPLOYMENT OF PROPERLY REGISTERED APPRENTICES**

(a) Nothing in this chapter shall prevent the employment of properly registered apprentices upon public works.

(b) Every apprentice employed upon public works shall be paid the prevailing rate of per diem wages for apprentices in the trade to which he or she is registered and shall be employed only at the work of the craft or trade to which he or she is registered.

(c) Only apprentices, as defined in Section 3077, who are in training under apprenticeship standards that have been approved by the Chief of the Division of Apprenticeship Standards and who are parties to written apprentice agreements under Chapter 4 (commencing with Section 3070) of Division 3 are eligible to be employed at the apprentice wage rate on public works. The employment and training of each apprentice shall be in accordance with either of the following:

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- (1) The apprenticeship standards and apprentice agreements under which he or she is training.
- (2) The rules and regulations of the California Apprenticeship Council.

(d) When the contractor to whom the contract is awarded by the state or any political subdivision, in performing any of the work under the contract, employs workers in any apprenticeable craft or trade, the contractor shall employ apprentices in at least the ratio set forth in this section and may apply to any apprenticeship program in the craft or trade that can provide apprentices to the site of the public work for a certificate approving the contractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, the decision of the apprenticeship program to approve or deny a certificate shall be subject to review by the Administrator of Apprenticeship. The apprenticeship program or programs, upon approving the contractor, shall arrange for the dispatch of apprentices to the contractor. A contractor covered by an apprenticeship program's standards shall not be required to submit any additional application in order to include additional public works contracts under that program. "Apprenticeable craft or trade," as used in this section, means a craft or trade determined as an apprenticeable occupation in accordance with rules and regulations prescribed by the California Apprenticeship Council. As used in this section, "contractor" includes any subcontractor under a contractor who performs any public works not excluded by subdivision (o).

(e) Prior to commencing work on a contract for public works, every contractor shall submit contract award information to an applicable apprenticeship program that can supply apprentices to the site of the public work. The information submitted shall include an estimate of journeyman hours to be performed under the contract, the number of apprentices proposed to be employed, and the approximate dates the apprentices would be employed. A copy of this information shall also be submitted to the awarding body if requested by the awarding body. Within 60 days after concluding work on the contract, each contractor and subcontractor shall submit to the awarding body, if requested, and to the apprenticeship program a verified statement of the journeyman and apprentice hours performed on the contract. The information under this subdivision shall be public. The apprenticeship programs shall retain this information for 12 months.

(f) The apprenticeship program that can supply apprentices to the area of the site of the public work shall ensure equal employment and affirmative action in apprenticeship for women and minorities.

(g) The ratio of work performed by apprentices to journeymen employed in a particular craft or trade on the public work may be no higher than the ratio stipulated in the apprenticeship standards under which the apprenticeship program operates where the contractor agrees to be bound by those standards, but, except as otherwise provided in this section, in no case shall the ratio be less than one hour of apprentice work for every five hours of journeyman work.

(h) This ratio of apprentice work to journeyman work shall apply during any day or portion of a day when any journeyman is employed at the jobsite and shall be computed on the basis of the hours worked during the day by journeymen so employed. Any work performed by a journeyman in excess of eight hours per day or 40 hours per week shall not be used to calculate the ratio. The contractor shall employ apprentices for the number of hours computed as above before the end of the contract or, in the case of a subcontractor, before the end of the subcontract. However, the contractor shall endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the jobsite. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Chief of the

LABOR COMPLIANCE PROGRAM AND LABOR AND OTHER CODE REQUIREMENTS CERTIFICATE  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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Division of Apprenticeship Standards, upon application of an apprenticeship program, may order a minimum ratio of not less than one apprentice for each five journeymen in a craft or trade classification.

(i) A contractor covered by this section that has agreed to be covered by an apprenticeship program's standards upon the issuance of the approval certificate, or that has been previously approved for an apprenticeship program in the craft or trade, shall employ the number of apprentices or the ratio of apprentices to journeymen stipulated in the applicable apprenticeship standards, but in no event less than the 1-to-5 ratio required by subdivision (g).

(j) Upon proper showing by a contractor that he or she employs apprentices in a particular craft or trade in the state on all of his or her contracts on an annual average of not less than one hour of apprentice work for every five hours of labor performed by journeymen, the Chief of the Division of Apprenticeship Standards may grant a certificate exempting the contractor from the 1-to-5 hourly ratio, as set forth in this section for that craft or trade.

(k) An apprenticeship program has the discretion to grant to a participating contractor or contractor association a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting the contractor from the 1-to-5 ratio set forth in this section when it finds that any one of the following conditions is met:

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

(2) The number of apprentices in training in the area exceeds a ratio of 1 to 5.

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

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

(l) When an exemption is granted pursuant to subdivision (k) to an organization that represents contractors in a specific trade from the 1-to-5 ratio on a local or statewide basis, the member contractors shall not be required to submit individual applications for approval to local joint apprenticeship committees, if they are already covered by the local apprenticeship standards.

(m)(1) A contractor to whom a contract is awarded, who, in performing any of the work under the contract, employs journeymen or apprentices in any apprenticeable craft or trade shall contribute to the California Apprenticeship Council the same amount that the director determines is the prevailing amount of apprenticeship training contributions in the area of the public works site. A contractor may take as a credit for payments to the council any amounts paid by the contractor to an approved apprenticeship program that can supply apprentices to the site of the public works project. The contractor may add the amount of the contributions in computing his or her bid for the contract.

(2) At the conclusion of the 2002-03 fiscal year and each fiscal year thereafter, the California Apprenticeship Council shall distribute training contributions received by the council under this

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subdivision, less the expenses of the Division of Apprenticeship Standards for administering this subdivision, by making grants to approved apprenticeship programs for the purpose of training apprentices. The funds shall be distributed as follows:

(A) If there is an approved multiemployer apprenticeship program serving the same craft or trade and geographic area for which the training contributions were made to the council, a grant to that program shall be made.

(B) If there are two or more approved multiemployer apprenticeship programs serving the same craft or trade and geographic area for which the training contributions were made to the council, the grant shall be divided among those programs based on the number of apprentices registered in each program.

(C) All training contributions not distributed under subparagraphs (A) and (B) shall be used to defray the future expenses of the Division of Apprenticeship Standards.

**4 - LABOR CODE SECTION 1810  
DEFINITION: A LEGAL DAY'S WORK**

Eight hours labor constitutes a legal day's work in all cases where the same is performed under the authority of any law of this State, or under the direction, or control, or by the authority of any officer of this State acting in his official capacity, or under the direction, or control or by the authority of any municipal corporation, or of any officer thereof. A stipulation to that effect shall be made a part of all contracts to which the State or any municipal corporation therein is a party.

**5 - LABOR CODE SECTION 1811  
TIME OF SERVICE - CALENDAR WEEK**

The time of service of any workman employed upon public work is limited and restricted to 8 hours during any one calendar day, and 40 hours during any one calendar week, except as hereinafter provided for under Section 1815.

**6 - LABOR CODE SECTION 1812  
ACCURATE LABOR RECORDS**

Every contractor and subcontractor shall keep an accurate record showing the name of and actual hours worked each calendar day and each calendar week by each worker employed by him or her in connection with the public work. The record shall be kept open at all reasonable hours to the inspection of the awarding body and to the Division of Labor Standards Enforcement.

**7 - LABOR CODE SECTION 1813  
PENALTY FOR OVERTIME ON ANY PUBLIC WORK CONTRACT**

The contractor or subcontractor shall, as a penalty to the state or political subdivision on whose behalf the contract is made or awarded, forfeit twenty-five dollars (\$25) for each worker employed in the execution of the contract by the respective contractor or subcontractor for each calendar day during which the worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week in violation of the provisions of this article. In awarding any contract for public work, the awarding body shall cause to be inserted in the contract a stipulation to this effect. The awarding body shall take cognizance of all violations of

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this article committed in the course of the execution of the contract, and shall report them to the Division of Labor Standards Enforcement.

**8 - LABOR CODE SECTION 1814  
MISDEMEANOR**

Any officer, agent, or representative of the State or any political subdivision who violates any provision of this article and any contractor or subcontractor or agent or representative thereof doing public work who neglects to comply with any provision of Section 1812 is guilty of a misdemeanor.

**9 - LABOR CODE SECTION 1815  
MINIMUM OVERTIME PAY**

Notwithstanding the provisions of Sections 1810 to 1814, inclusive, of the Labor code, and notwithstanding any stipulation inserted in any contract pursuant to the requirements of said sections, work performed by employees of contractors in excess of 8 hours per day, and 40 hours during any one week, shall be permitted upon public work upon compensation for all hours worked in excess of 8 hours per day at not less than 1 1/2 times the basic rate of pay.

**10 - LABOR CODE SECTION 1860  
CONTRACT PROVISION**

The awarding body shall cause to be inserted in every public works contract a clause providing that, 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.

**11 - LABOR CODE SECTION 1861  
CONTRACTOR CERTIFICATION TO LABOR CODE SECTION 3700**

Each contractor to whom a public works contract is awarded shall sign and file with the awarding body the following certification prior to performing the work of the contract: "I am 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 I will comply with such provisions before commencing the performance of the work of this contract."

**12 - LABOR CODE SECTION 6500 AND 6705  
TRENCH EXCAVATION SAFETY PLANS**

1. The Contractor's attention is directed to the provisions of Labor Code section 6705 concerning trench excavation safety plans. Labor code section 6705 provides in relevant part:

No contract for public works involving an estimated expenditure in excess of twenty-five thousand dollars (\$25,000), for the excavation of any trench or trenches five feet or more in depth, shall be awarded unless it contains a clause requiring submission by the contractor and acceptance by the awarding body or by a registered civil or structural engineer, employed by the awarding body, to whom authority to accept has been delegated, in advance of excavation, of a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such

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plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

Nothing in this section shall be deemed to allow the use of a shoring, sloping, or protective system less effective than that required by the Construction Safety Orders.

2. Before execution of the contract by the Owner, the Contractor shall submit to the Owner a copy of his permit for the project issued by Cal-OSHA.

If there is any non-compliance with said detailed plans, the Contractor shall stop forthwith all affected work until there is compliance in the opinion of the State Division of Industrial Safety. The Owner, Engineer, officers, employees, consultants, and agents of the aforementioned, shall not be liable for costs incurred by the Contractor due to work stoppage, and the Contractor will not be given nor is entitled to an extension of time to complete the Work within the time set forth in this contract due to the work stoppage.

**13 - NONDISCRIMINATION CLAUSE**

1. During the performance of the Contract, contractor and its subcontractors shall not unlawfully discriminate against any employee or applicant for employment because of race, religion, color, national origin, ancestry, physical handicap, medical condition, marital status, age (over 40) or sex. Contractors and subcontractors shall insure that the evaluation and treatment of their employees and applicants for employment are free of such discrimination. Contractors and subcontractors shall comply with the provisions of the Fair Employment and Housing Act (Government Code Section 12900 et seq.) and the applicable regulations promulgated thereunder (California Administrative Code, Title 2, Section 7285.0 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code, Section 12900, set forth in Chapter 5 of Division 4 of Title 2 or the California Administrative Code are incorporated into this contract by reference and made a part hereof as if set forth in full. Contractor and its subcontractor shall give written notice of their obligations under this clause to labor organizations with which they have a collective bargaining or other agreement.

2. Contractor's attention is also directed to Section 1735 of the Labor Code, which provides:

"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."

3. Contractor's attention is further directed to Section 1777.6 of the Labor Code, which provides:

"An employer or a labor union shall not refuse to accept otherwise qualified employees as registered apprentices on any 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 provided in Section 3077 of this code and Section 12940 of the Government Code."

4. This contractor shall include the nondiscrimination and compliance provisions of this clause in all subcontracts to perform work under the Contract.

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**14 - DRUG-FREE WORKPLACE CERTIFICATION  
CONTRACTOR:**

The contractor named below hereby certifies compliance with The Drug-Free Workplace Act of 1990 (Government Code 8350 et seq.) in matters relating to providing a drug-free workplace. The below named contractor will:

1. Publish a statement notifying employees that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees for violations, as required by Government Code Section 8355(a).
2. Establish a Drug-Free Awareness Program as required by Government Code Section 8355(b), to inform employees about all of the following:
  - (a) The dangers of drug abuse in the workplace,
  - (b) The person's or organization's policy of maintaining a drug-free workplace,
  - (c) Any available counseling, rehabilitation and employee assistance programs, and
  - (d) Penalties that may be imposed upon employees for drug abuse violations.
3. Provide as required by Government Code Section 8355(c), that every employee who works on the proposed contract:
  - (a) Will receive a copy of the company's drug-free policy statement, and
  - (b) Will agree to abide by the terms of the company's statement as a condition of employment on the contract.

**15 - LABOR COMPLIANCE MONITORING**

No contractor or subcontractor may be listed on a bid proposal for a public works project (submitted on or after March 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 [with limited exceptions from this requirement for bid purposes only under Labor Code section 1771.1(a)].

No contractor or subcontractor may be awarded a contract for public work on a public works project (awarded on or after April 1, 2015) unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

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**THE UNDERSIGNED CERTIFIES THAT, IN PERFORMANCE OF THE CONTRACT, THE CONTRACTOR WILL COMPLY WITH THE ABOVE REQUIREMENTS IN ADDITION TO OTHER LEGAL REQUIREMENTS.**

CONTRACTOR NAME: \_\_\_\_\_

CERTIFIED BY:

NAME: \_\_\_\_\_ TITLE: \_\_\_\_\_

SIGNATURE: \_\_\_\_\_ DATE: \_\_\_\_\_

**END SECTION**

LABOR COMPLIANCE PROGRAM AND LABOR AND OTHER CODE REQUIREMENTS CERTIFICATE  
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## **SECTION 00 50 00**

### **BID PROTEST PROCEDURES**

#### **BID PROTEST.**

Any bid protest must be in writing and received by Lower Tule River Irrigation District at 357 E Olive Ave, Tipton, CA 93272 before 5:00 p.m. on the second working day following bid opening (the "Bid Protest Deadline") and must comply with the following requirements:

#### **General.**

Only a Bidder who has actually submitted a Bid Proposal is eligible to submit a bid protest against another bidder. Subcontractors are not eligible to submit bid protests. A bidder may not rely on the bid protest submitted by another bidder, but must timely pursue its own protest.

If required by City, the protesting bidder must submit a non-refundable fee in the amount specified by City, based upon City's reasonable costs to administer the bid protest. Any such fee must be submitted to City no later than the Bid Protest Deadline, unless otherwise specified.

For purposes of this Section, a "working day" means a day that City is open for normal business, and excludes weekends and holidays observed by City. For example, if the bid opening were on a Thursday at 2:00 p.m., and the following Monday were a holiday observed by the City, bidders' protests would be due by 5:00 p.m. on the Tuesday following the bid opening. Friday and Tuesday would be the first and second working days following the bid opening, respectively.

#### **Protest Contents.**

The bid protest must contain a complete statement of the basis for the protest and all supporting documentation. Material submitted after the Bid Protest Deadline will not be considered. The protest must refer to the specific portion or portions of the Contract Documents upon which the protest is based. The protest must include the name, address, email address, and telephone number of the person representing the protesting bidder if different from the protesting bidder.

#### **Copy to Protested Bidder.**

A copy of the protest and all supporting documents must be concurrently transmitted by fax or by email, by or before the Bid Protest Deadline, to the protested bidder and any other bidder who submitted a bid lower than the bid submitted by the protesting bidder.

#### **Response to Protest.**

The protested bidder may submit a written response to the protest, provided the response is received by City before 5:00 p.m., on the second working day after the Bid Protest Deadline or the actual receipt of the bid protest, whichever is sooner (the "Response Deadline"). The response must include all supporting documentation.

Material submitted after the Response Deadline will not be considered. The response must include the name, address, email address, and telephone number of the person

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representing the protested bidder if different from the protested bidder.

**Copy to Protesting Bidder.**

A copy of the response and all supporting documents must be concurrently transmitted by fax or by email, by or before the Response Deadline, to the protesting bidder and any other bidder who submitted a bid lower than the bid submitted by the protesting bidder.

**Exclusive Remedy.**

The procedure and time limits set forth in this section are mandatory and are the bidder's sole and exclusive remedy in the event of bid protest. A bidder's failure to comply with these procedures will constitute a waiver of any right to further pursue a bid protest, including filing a Government Code Claim or initiation of legal proceedings.

**Right to Award.**

The Lower Tule River Irrigation District reserves the right to award the Contract to the bidder it has determined to be the responsible bidder submitting the lowest responsive bid, and to issue a Notice to Proceed with the Work notwithstanding any pending or continuing challenge to its determination.

**END SECTION**

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**SECTION 00 51 00**  
**NOTICE OF AWARD**

TO: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

PROJECT: Lower Tule River Irrigation District  
Tipton Pipeline

The Owner has considered the bid submitted by you for the bid opening held on **November 8, 2024** for the above described Work in response to its Request for Bids and the Instructions to Bidders.

You are hereby notified that your bid has been accepted, and the sum of the items amounts to \$ \_\_\_\_\_.

You are required by the Instructions to Bidders to execute the Contract and provide the necessary bonds and insurance certificates within ten (10) calendar days from the date of this Notice.

If you fail to execute said Contract within ten (10) days from the date of this Notice, Owner will be entitled to consider all your rights arising out of Owner's acceptance of your bid as abandoned. The owner will be entitled to such other rights as may be granted by law.

You are required to return an acknowledged copy of this Notice of Award to Owner.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

Lower Tule River Irrigation District  
OWNER

By: \_\_\_\_\_  
Eric Limas

Title: General Manager

**ACCEPTANCE OF NOTICE**

Receipt of the foregoing Notice of Award is hereby acknowledged

By: \_\_\_\_\_

this the \_\_\_\_\_ Day of \_\_\_\_\_, 20\_\_\_\_\_

By: \_\_\_\_\_

Title \_\_\_\_\_

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**END SECTION**

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**SECTION 00 52 13  
CONTRACT**

THIS CONTRACT is made at **Lower Tule River Irrigation District** in **Tulare** County, California, by and between \_\_\_\_\_ hereinafter called the "Contractor," and the **Lower Tule River Irrigation District**, a California County Irrigation District, hereinafter called the "Owner".

Contractor and the Owner, for the consideration hereinafter named, agree as follows:

**ARTICLE I. SCOPE OF WORK.** The Work to be constructed is a project entitled Tipton Pipeline, located in Tulare\_County, State of California.

The Contractor shall furnish all labor and materials, including tools, implements, and appliances required to construct the Work and shall perform and construct all Work in a good and workmanlike manner, free from any and all liens and claims including those of mechanics, materialmen, sub-contractors, artisans, machinists, teamsters, draymen and laborers required for the construction of the Work.

Contractor shall comply with and construct the Work in strict conformity with the Contract Documents, including that set of Plans, entitled: "Tipton Pipeline," all other Plans, Drawings, Specifications; and the provisions of this Contract.

**ARTICLE II. CONTRACT DOCUMENTS.** The Contract Documents shall consist of the following documents, each of which is on file in the office of the Owner and all of which are incorporated herein and made a part hereof by reference thereto: this Contract, including, Division 0 – Bidding and Contract Requirements, Division 1 - General Requirements, Division 2 through Division 48 - Technical Specifications, any Standard Specifications referenced, Plans, Profiles and Drawings, Addenda or Change Orders (if any), and Appendices. In the event of conflict between portions of the Contract Documents, refer to Section 01 00 05 – Specifications to resolve priority.

**ARTICLE III. PAYMENT.** In the manner, at the time and upon the conditions stated in the Contract Documents, Owner agrees to pay the Contractor in current funds for the performance of the Contract the sum of:

\_\_\_\_\_  
(Figures in Words)

\_\_\_\_\_  
(Figures in Numbers)

It is understood that said price is based upon the estimated quantities of materials to be used as set forth in the Bidder's Proposal, except where provisions are made in the Contract Documents whereby the estimated quantities shall constitute the final quantity.

Contractor is responsible for payment of prevailing wages in accordance with the provisions of Section 1770, et seq. of the Labor Code. Prevailing wage schedules for Tulare County are available from the Department of Industrial Relations-Division of Labor Statistics & Research via the Internet at [www.dir.ca.gov](http://www.dir.ca.gov). A prevailing wage scale is also on file in the office of the Lower

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Tule River Irrigation District, 357 E Olive Ave, Tipton, CA 93272 and copies may be obtained upon request.

**ARTICLE IV. TERMINATION.** If the Contractor should be adjudged as bankrupt, or if he should make a general assignment for the benefit of his creditors, or if a receiver should be appointed on account of his insolvency, or if he or any of his sub-contractors should violate any of the provisions, including, but not limited to, failure to meet the time of commencement and time of completion requirements in Section 00 52 13, of the Contract Documents, or if he should refuse or fail, except in cases for which extension of time is provided, to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to sub-contractors or for material or labor, or disregard laws, ordinances or the instructions of the Engineer, then the Owner may serve written notice upon the Contractor and his surety of material breach and its intention to terminate the Contract, such notice to contain the reasons for such intention to terminate the contract, and unless, within seven (7) days after the serving of such notice, Contractor performs as required by the Contract Documents or makes valid objection to termination, the contract shall, upon the expiration of said seven days, cease and terminate. If Contractor does not perform or make valid objection in response to such notice, then it waives all rights to perform the contract, to submit a claim for costs caused by the Owner's performance of the contract, or to object to the Owner withholding its costs in performing the contract.

In the event of any such termination, the Owner may immediately take over performance of the contract and prosecute the work to completion as provided below, if immediate action is required because exigent circumstances are reasonably determined to exist by the Owner, or serve written notice thereof upon the surety and the Contractor, and the surety shall have the right to take over and perform the contract, provided, however, that if the surety within seven (7) days after the serving upon it of notice of termination does not give the Owner written notice of its intention to take over and perform the contract or does not commence performance thereof within the seven (7) days stated above from the date of the serving of such notice, the Owner may take over the work and prosecute the same to completion by force account, either with its own forces or with a contractor of its choice, or by any other method it may deem advisable, for the account and at the expense of the Contractor, and the Contractor and his surety shall be liable to the Owner for any excess cost occasioned the Owner thereby, and in such event the Owner may without liability for doing so, take possession of and utilize in completing the work such materials, appliances, plant and other property belonging to the Contractor as may be on the site of the Work and necessary therefore. In such case the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the contract price shall exceed the expenses of finishing the Work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If the expense shall exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The expense incurred by the Owner, as herein provided and damage incurred through the Contractor's default, shall be certified by the Engineer.

When the contract has been terminated as provided above or elsewhere in the Contract Documents, such termination shall not affect any rights of the Owner against the Contractor then existing or which may thereafter accrue.

**ARTICLE V. SUSPENSION OF WORK.** At any time and without cause, Owner may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by written notice to Contractor and Engineer. Such notice will fix the date on which Work will be resumed.

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Contractor shall resume the Work on the date so fixed. Contractor shall be entitled to an extension of the Contract Times. Contractor may be entitled to an adjustment in the Contract Price that is directly attributable to any such suspension. A Change Proposal seeking adjustments in the Contract Price shall be submitted no later than 30 days after the date fixed for resumption of Work.

**ARTICLE VI. WORKERS' COMPENSATION.** Contractor represents that he has secured the payment of Worker's Compensation in compliance with the provisions of the Labor Code of the State of California and during the performance of the Work will so to comply with the said provisions of said Code. Contractor shall supply the Owner with certificates of insurance, in triplicate, evidencing that Worker's Compensation Insurance is in effect and providing that the Owner will receive ten days notice of cancellation. If Contractor self-insures Worker's Compensation, Certificate of Consent to Self-Insure should be provided the Owner.

**ARTICLE VII. JOB SITE CONDITIONS.** Contractor shall assume sole and complete responsibility for job site conditions during the course of construction of the project Work, including safety of all persons and property; and that this requirement shall apply continuously and not be limited to normal working hours.

**ARTICLE VIII. CHANGES IN THE WORK.** New and unforeseen work will be classed as extra work when determined by the Owner that such work is not covered by any of the various items or combination of such items for which there is a bid price. In the event that portions of such work are determined by the Owner to be covered by some of the various items or combinations of such items for which there is a bid price, the remaining portion of such work will be classified as extra work. Extra work also includes work specifically designated as extra work in the Plans and Specifications. Refer to Section 00 63 44 – Changes to the Work.

**ARTICLE IX. COMPLETION.** Upon receipt of written notice that the Work is ready for final review, the Engineer and Owner will promptly make such review, and when the Owner finds the Work satisfactory under the Contract and the Contract fully performed, the Owner will promptly issue a Notice of Completion stating that the Work required by this Contract has been completed. Within 10 days of acceptance, the Owner shall cause the Notice of Completion to be recorded. Final payment shall become due thirty-five (35) days after the date of the recording of the Notice of Completion.

Before issuance of final payment, the Contractor shall submit Conditional Releases as specified in Section 00 52 21 – Waiver and Release Submittals, except that, in the case of disputed indebtedness or liens, the Contractor may submit, in lieu of evidence of payment, a Surety Bond satisfactory to the Owner guaranteeing payment of all such disputed amounts when adjudicated.

**ARTICLE X. TIME OF PERFORMANCE.** The Notice to Proceed is specified in Section 00 55 00 – Notice to Proceed. Beginning of Work and Time of Completion are specified in Section 01 11 00 – Description of Work and Schedule Constraints. Liquidated Damages are those specified in Section 00 52 15 – Liquidated Damages. All time limits stated in the Contract Documents are of the essence.

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**ARTICLE XI. INDEMNITY AND INSURANCE.** Contractor shall indemnify Owner in accordance with the provisions of Section 00 73 15 – Indemnity Agreement. Prior to commencing Work, the Contractor shall obtain at his own expense, and agrees to keep in effect during the life of this Contract, as a minimum requirement, the insurance described in Section 00 73 16 – Insurance Requirements. The Contractor shall furnish evidence of the required insurance coverages to the Owner prior to execution of the Contract Documents.

**ARTICLE XII. ASSIGNMENT OF CLAYTON ACT AND CARTWRIGHT ACT RIGHTS.**

Per Government Code Section 4552, in submitting its Bid and entering into the Contract or a subcontract to supply goods, services, or materials pursuant to the Contract, the Contractor or subcontractor offers and agrees to assign to the Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Sec. 15) or under the Cartwright Act (Chapter 2 (commencing with Section 16700) of Part 2 of Division 7 of the Business and Professions Code), arising from purchases of goods, services, or materials pursuant to the Contract or any subcontract. This assignment shall be made and become effective at the time the Owner tenders final payment to the Contractor, without further acknowledgment by the parties.

**ARTICLE XIII. ASSIGNMENT AND TRANSFER OF CONTRACT.** The Contractor shall not assign or transfer this Contract or any part thereof or any interest therein without consent in writing of the Owner and the Contractor's Surety, and any such assignment or transfer without such written consent shall be null and void.

**ARTICLE XIV. CLAIMS AND DISPUTE RESOLUTION.** Claims and disputes shall be resolved in accordance with the provisions of Public Contracts Code Section 9204, as set forth in Section 00 64 00 of these specifications.

**ARTICLE XV. HEADINGS AND INTERPRETATION.** The headings in the Contract Documents are solely for the convenience of the parties, and are not intended to and shall not be construed to in any way limit Contractor's duties with respect to the performance of the Work as provided in the Contract Documents. Any uncertainty or ambiguity in the language of this Contract or the Contract Documents shall not be construed against the party drafting the same, but shall be construed as if both parties prepared the same and any provision to the contrary in Civil Code § 1654 is waived by the parties.

**ARTICLE XVI. REMEDIES .** The remedies given to Owner in the Contract Documents shall not be exclusive, but shall be cumulative and in addition to all remedies now or hereafter allowed by law.

If any provision of the Contract Documents is void or unenforceable, the same shall in no way affect the validity or enforceability of any other provision of the Contract Documents or the validity or enforceability of this Contract as a whole.

This Contract shall be binding upon and shall inure to the benefit of the parties hereto, as well as their respective heirs, successors and assigns.

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IN WITNESS WHEREOF, they had executed this Contract this \_\_\_\_\_ day of  
\_\_\_\_\_, 2024.

\_\_\_\_\_  
Contractor

Lower Tule River Irrigation District  
\_\_\_\_\_  
Owner

By \_\_\_\_\_

By \_\_\_\_\_  
Eric Limas, General Manager

By \_\_\_\_\_  
John Michael Domondon, District Engineer

ATTEST: \_\_\_\_\_

**END SECTION**

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**SECTION 00 52 15**  
**LIQUIDATED DAMAGES**

**PART 1 GENERAL**

*1.1 LIQUIDATED DAMAGES*

- A. The Contractor shall pay to the Owner the sum of

TWO THOUSAND DOLLARS (\$ 2,000.00)

per day for each and every calendar day's delay in finishing the work in excess of the number of calendar days prescribed in Section 00 21 13 of these specifications.

- B. It is agreed by the parties to the contract that in case all the work called for under the contract in all parts and requirements is not finished or completed within the number of calendar days as set forth above, damage will be sustained by the Lower Tule River Irrigation District, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the Lower Tule River Irrigation District will sustain in the event of and by reason of the delay; and it is therefore agreed that the Contractor will pay to the Lower Tule River Irrigation District the sum set forth above per day for each and every calendar day's delay in finishing the work in excess of the number of calendar days prescribed; and the Contractor agrees to pay the liquidated damages herein provided for, and further agrees that the Lower Tule River Irrigation District may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.
- C. It is further agreed that in case the work called for under the contract is not finished and completed in all parts and requirements within the number of calendar days specified, the Engineer shall have the right to increase the number of calendar days or not, as the Engineer may deem best to serve the interest of the Lower Tule River Irrigation District and if the Engineer decides to increase the number of calendar days, the Engineer shall further have the right to charge to the Contractor, or the Contractor's heirs, assigns or sureties and to deduct from the final payment for the work all or any part, as the Engineer may deem proper, of the actual cost of engineering, inspection, superintendence, and other overhead expenses which are directly chargeable to the contract, and which accrue during the period of the extension, except that cost of final surveys and preparation of final estimate shall not be included in the charges.
- D. The Contractor will be granted an extension of time and will not be assessed with liquidated damages or the cost of engineering and inspection for any portion of the delay in completion of the work beyond the time named above for the completion of the work caused by acts of God or of the public enemy, fire, floods, tsunamis, earthquakes, epidemics, quarantine restrictions, strikes, labor disputes, shortage of materials and freight embargoes, provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of that delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive.

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- E. No extension of time will be granted for a delay caused by a shortage of materials unless the Contractor furnishes to the Engineer documentary proof that the Contractor has made every effort to obtain the materials from all known sources within reasonable reach of the work in a diligent and timely manner, and further proof in the form of supplementary progress schedules that the inability to obtain the materials when originally planned did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the Contractor's operations. The term "shortage of materials," as used in this section, shall apply only to materials, articles, parts or equipment which are standard items and are to be incorporated in the work. The term "shortage of materials," shall not apply to materials, parts, articles or equipment which are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only physical shortage of material will be considered as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.
- F. If the Contractor is delayed in completion of the work by reason of changes made by Lower Tule River Irrigation District or by failure of the Lower Tule River Irrigation District to acquire or clear right of way, or by any act of the Engineer or of the Lower Tule River Irrigation District not contemplated by the contract, an extension of time commensurate with the delay in completion of the work thus caused will be granted, and the Contractor shall be relieved from any claim for liquidated damages, or engineering and inspection charges or other penalties for the period covered by that extension of time; provided that the Contractor shall notify the Engineer in writing of the causes of delay within 15 days from the beginning of the delay. The Engineer shall ascertain the facts and the extent of the delay, and the Engineer's findings thereon shall be final and conclusive.

**END SECTION**

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**SECTION 00 52 17**  
**CONTRACTOR'S RESPONSIBILITIES**

**PART 1 GENERAL**

*1.1 SUPERVISION AND SUPERINTENDENCE*

- A. Contractor shall supervise, inspect, and direct the Work competently and apply such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the specific means, methods, techniques, sequence, or procedure of construction required to complete the project as specified by the Contract Documents. Contractor shall be responsible to see that the completed Work complies accurately with the Contract Documents.
- B. At all times during the progress of the Work, Contractor shall assign a competent resident superintendent thereto who shall not be replaced without written notice to Engineer except under extraordinary circumstances. The superintendent will be Contractor's representative at the Site and shall have authority to act on behalf of Contractor. All communications given to or received from the superintendent shall be binding on Contractor.

*1.2 MAINTAINING TRAFFIC*

- A. Traffic and Access: The Contractor's operations shall cause no unnecessary inconvenience. The access rights of the public shall be considered at all times. Unless otherwise authorized, traffic shall be permitted to pass through the Work, otherwise a detour, approved by the Engineer, shall be provided. Whenever it is necessary to cross, obstruct, or close roads, driveways and walks, whether public or private, Contractor shall provide and maintain suitable and safe bridges, detours, or other temporary expedients for the accommodation of public and private travel, and shall give reasonable notice to owners of private drives before interfering with them. Such maintenance of traffic will not be required when Contractor has obtained written permission from the owner and tenant of private property involved, to obstruct traffic at the designated point.
- B. In making open cut street crossings, Contractor shall not block more than one-half of the street at a time.
- C. Contractor shall construct substantial bridges (trench plates when adequate) at all points where it is necessary to maintain traffic across pipeline construction. Bridges in public streets shall be acceptable to the Owner. Bridges erected in private roads and driveways shall be adequate for the service to which they will be subjected. Bridges shall be maintained in place as long as the conditions of the work require their use for safety of the public, except that when necessary for the proper prosecution of the Work in the immediate vicinity of a bridge, the bridge may be relocated or temporarily removed for such period as Engineer may permit.
- D. The type and location of signs, lights, flags, flagmen and other traffic control and safety devices shall be in accordance with the "California Manual on Uniform Traffic

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Control Devices” (CA MUTCD), latest edition, issued by the State of California, Department of Transportation. Copies of the Manual may be obtained from the Permits Engineer, State Department of Transportation, or on the internet at [www.dot.ca.gov](http://www.dot.ca.gov).

- E. Reflectivity of construction signs shall conform to the State Standard Specifications.
- F. Based on all the above, Contractor shall determine the need for any signs, lights, flags, flagmen and any other traffic control and traffic safety devices and shall include all such costs in the Traffic Control item of Contractor’s Bid. No other compensation will be made.

1.3 OBSTRUCTIONS

- A. Attention is directed to the possible existence of underground utility facilities not indicated on the plans and to the possibility that utility lines may be in a location different from that which is indicated on the plans. The Contractor shall ascertain the exact location of underground utilities whose presence is indicated on the plans, the location of their service laterals or other appurtenances, and of existing service lateral or appurtenances of any other underground facilities which can be inferred from the presence of visible facilities such as buildings, meters and junction boxes, prior to doing work that may damage any of the facilities or interfere with their service.
- B. If the Contractor cannot locate an underground facility whose presence is indicated on the plans, the Contractor shall so notify the Engineer in writing. If the facility for which the notice is given is in a substantially different location from that indicated on the plans or in the special provisions, the additional cost of locating the facility will be paid for as extra work as provided in the General Conditions.
- C. If the Contractor discovers underground utilities not indicated on the Plans, the Contractor shall immediately give the Engineer and the Utility Company written notification of the existence of those facilities. The utilities shall be located and protected from damage as directed by the Engineer, and the cost of that work will be paid for as extra work as provided in the General Conditions. The Contractor shall, if directed by the Engineer, repair any damage which may occur to the utilities. The cost of that repair work, not due to the failure of the Contractor to exercise reasonable care, will be paid for as extra work as provided in the General Conditions. Damage due to the Contractor's failure to exercise reasonable care shall be repaired at the Contractor's cost and expense.
- D. Where it is determined by the Engineer that the rearrangement of an underground facility is essential in order to accommodate the project improvements and the plans do not provide that the facility is to be rearranged, the Engineer will provide for the rearrangement of the facility by other forces or the rearrangement shall be performed by the Contractor and will be paid for as extra work.
- E. When ordered by the Engineer in writing, the Contractor shall rearrange any utility or other non highway facility necessary to be rearranged as a part of the project improvements, and that work will be paid for as extra work.

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- F. Should the Contractor desire to have any rearrangement made in any utility facility, or other improvement, for the Contractor's convenience in order to facilitate the Contractor's construction operations, which rearrangement is in addition to, or different from, the rearrangements indicated on the Plans, the Contractor shall make whatever arrangements are necessary with the owners of the utility or other facility for the rearrangement and bear all expenses in connection therewith.
- G. The Contractor shall immediately notify the Engineer of any delays to the Contractor's operations as a direct result of utility facilities which were not indicated on the Plans or were located in a position substantially different from that indicated on the Plans, or as a direct result of utility or other non highway facilities not being rearranged as herein provided (other than delays in connection with rearrangements made to facilitate the Contractor's construction operations or delays due to a strike or labor dispute). These delays will be considered delays within the meaning of Section 8 1.07, "Delays" of the State Standard Specifications, and compensation for the delay will be determined in conformance with the provisions in Section 8 1.07. The Contractor shall be entitled to no other compensation for that delay.
- H. Any delays to the Contractor's operations as a direct result of utility or other non highway facilities not being rearranged as provided in this Section, due to a strike or labor dispute, will entitle the Contractor to an extension of time as provided in Section 00 52 15 - Beginning of Work, Time of Completion & Liquidated Damages. The Contractor shall be entitled to no other compensation for that delay.
- I. Full compensation for conforming to the requirements of this article shall be considered as included in the various contract items of work and no separate payment will be made therefore.

**1.4 PRE-CONSTRUCTION MEETING**

- A. The Contractor and its job superintendent, the Contractor's subcontractors and their job superintendents will be required to attend the pre-construction conference scheduled by the Owner as specified in Section 01 31 19 – Project Meetings. A project schedule shall be submitted by the Contractor at this meeting.

**1.5 SAFETY REPRESENTATIVE**

- A. The Contractor shall provide, at the site, such equipment and medical facilities as are necessary to supply first aid service to anyone who may be injured in connection with the Work. The Contractor must promptly report in writing to the Engineer all accidents whatsoever arising out of, or in connection with the performance of the Work, whether on or adjacent to the site, with cause of death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injury or serious damage to the property are caused, the accident shall be reported immediately by telephone or messenger to the Engineer. If any claim is made by anyone against the Contractor or any subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Engineer, giving full details of the claim.

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1.6 SAFETY AND PROTECTION

- A. Safety and Protection: The Contractor shall have at the work site, copies or suitable extracts of Construction Safety Orders, issued by Cal-OSHA. He shall comply with provisions of these and all other applicable laws, ordinances and regulations.
1. Contractors must comply with provisions of the safety and health regulations for construction, promulgated by the Secretary of Labor under Section 107 of the Contract Work Hours and Safety Standards Act, as set forth in Title 29 C.F.R.
  2. In order to protect the lives and health of his employees under the Contract, the Contractor shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease, and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment or work under the Contract.
  3. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his facilities, appliances, and methods and for any damage which may result from their failure or their improper construction, maintenance or operation.
  4. The Contractor agrees that it shall assume sole and complete responsibility for job site conditions during the course of construction of this project, including safety of all persons and property; that this requirement shall apply continuously and not be limited to normal working hours; and that the Contractor shall defend, indemnify and hold the Owner, and Provost & Pritchard Engineering Group, Inc. harmless from any and all liability, real or alleged, in connection with the performance of work on this project, excepting for liability arising from the sole negligence of Owner or the Engineer.
  5. In accordance with generally accepted construction practices, the Contractor will be solely and completely responsible for conditions of the job site, including safety of all persons and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours.
  6. A potential biological problem of the Project area is the presence of tiny organisms living in the soil which can cause Valley Fever (coccidioidomycosis) in humans. As is typical of many desert and arid areas in the southwestern United States, Valley Fever is endemic to several counties in the south San Joaquin Valley including Fresno, Kern, Kings, Madera, Merced and Tulare. Monterey and San Luis Obispo Counties also have high rates of Valley Fever. Other counties may also be affected. The State of California should be contacted for updated information, one source of Valley Fever information is the State's web site link below: <https://www.cdph.ca.gov/Programs/CID/DCDC/Pages/Coccidioidomycosis.aspx>. Although everyone living in the valley has some contact with the disease-causing organisms, the illness is especially hazardous to those whose work

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brings them into close contact with the soil, for example, as in the case of agricultural and construction workers. The Contractor and his subcontractors are advised to notify their employees in writing and to obtain coccidioidin skin tests before commencing work on this project and at intervals thereafter as recommended by their family physician. The Contractor and his subcontractors shall advise their employees, in writing, to wear dust masks while working under dusty conditions or earthwork operations.

7. The duty of the Engineer to conduct construction review of the Contractor's performance and the undertaking of inspections by the Engineer or the giving of instructions as authorized herein is not intended to include review of the adequacy of the Contractor's safety measures in, on, or near the construction site and shall not be construed as supervision of the actual construction nor make the Engineer or the Owner responsible for providing a safe place for the performance of work by the Contractor, subcontractors, or suppliers; or for access, visits, use, work, travel or occupancy by any person.
8. The Owner, the Engineer, and their respective employees' site responsibilities are limited solely to the activities of the Owner's and Engineer's employees on site. These responsibilities shall not be inferred by any party to mean that the Owner or Engineer has responsibility for site safety. Safety in, on, or about the site is the sole and exclusive responsibility of the Contractor alone. The contractor's methods of work performance, superintendence and the Contractor's employees, and sequencing of construction are also the sole and exclusive responsibilities of the Contractor alone.

B. Contractor shall comply with Public Contract Code Section 7104

1. The Contractor's attention is directed to the provisions of Public Contract Code Section 7104. This section requires that any public works contract which involves digging trenches or other excavations that extend deeper than four feet below ground level contain provisions requiring that (i) the Contractor must notify the local agency of certain specified conditions relating to hazardous waste, unexpected subsurface or latent conditions, or unknown physical conditions, (ii) the local agency must promptly investigate any such conditions reported to it and issue a change order if it makes certain findings regarding those conditions, and (iii) in the event of a dispute between the local agency and the Contractor as to whether hazardous waste exists or whether the conditions encountered differ from those expected, the Contractor is not excused from performance, but must proceed with all Work to be performed under the contract.
2. Full compensation for all costs involved in locating, verifying, protecting, exposing, bracing, and otherwise providing for utilities and compliance with Public Contract Code Section 7104 shall be included in the amounts bid for Miscellaneous Facilities and Operations or the various items of Work, and no separate payment shall be made therefor.

C. The Contractor shall include all costs for the above items in the various bid items, and no separate payment will be made therefore.

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*1.7 ACCIDENT PREVENTION*

- A. Precaution shall be exercised by the Contractor at all times for the protection of persons (including Owner, Engineer, and Regulatory Agency employees) and property. The safety provisions of applicable laws, and of building and construction codes shall be observed. Machinery, equipment and other hazards shall be guarded or eliminated.
- B. First aid facilities and information posters conforming at least to the minimum requirements of the Occupational Safety and Health Administration shall be provided in a readily accessible location or locations.
- C. The Contractor shall make all reports as are, or may be, required by any authority having jurisdiction, and permit all safety inspections of the work being performed under this Contract. Before proceeding with any construction work, the Contractor shall take the necessary action to comply with all provisions for safety and accident prevention.

*1.8 PROTECTION OF EXISTING ITEMS*

- A. The Contractor shall protect all existing utilities, structures, trees, shrubs, and other items on the project site that are to be preserved, by substantial barricades or other devices commensurate with the hazard, from injury or destruction by vehicles, equipment, workmen, or other agents.
- B. Contractor will be held responsible for any damage to existing utilities, structures, roadways and walkways, Work; materials; or equipment because of his operations and shall repair or replace any damaged utilities, structures, roadways, and walkways, work, materials, or equipment to the satisfaction of, and at no additional cost to, the Owner.

*1.9 PROJECT SECURITY*

- A. The Contractor shall make adequate provision for the protection of the Work area against fire, theft, and vandalism, and for the protection of the public against exposure to injury.
- B. Sufficient number of fire extinguishers of the type and capacity required to protect the Work and ancillary facilities, shall be provided in readily accessible locations.

*1.10 PERMITS AND LICENSES*

- A. The Contractor shall procure all permits and licenses, pay all charges and fees, as required, and give all notices necessary and incidental to the due and lawful prosecution of the work.

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*1.11 PROJECT SITE MAINTENANCE*

- A. Throughout all phases of construction, including suspension of work, and until final acceptance of the project, the Contractor shall keep the work site clean and free from rubbish and debris.
- B. Materials and equipment shall be removed from the site as soon as they are no longer necessary; and upon completion of the work and before final inspection, the entire work site shall be cleared of equipment, unused materials and rubbish so as to present a satisfactory clean and neat appearance. All cleanup and project site maintenance costs shall be included in the Contractor's Bid.

*1.12 DEWATERING*

- A. Comply with Section 31 23 17 – Trenching, Backfilling and Compaction.

*1.13 STORM WATER CONTROL*

- A. Contractor shall be responsible for managing storm water runoff during the construction period. See Section 01 57 23 of these Specifications. Contractor's full range of responsibilities is set forth in that section, but includes the following non-exhaustive list of duties:
  - 1. Contractor shall prepare and submit a Storm Water Pollution Prevention Plan for the project. See Section 01 57 23 of these Specifications. This plan must be prepared by a Qualified SWPPP Developer (QSD) as recognized by the State of California.
  - 2. Contractor shall retain and provide the services of a Qualified SWPPP Practitioner (QSP) as recognized by the State of California, who shall perform or oversee all necessary monitoring, testing and reporting prescribed by the SWPPP and the State of California Construction General Permit. The QSP duties may be performed by the QSD.
  - 3. Contractor shall prepare and post to SMARTS all required testing and reporting as mandated by the SWPPP and the Construction General Permit, including periodic inspection reports, quarterly reports, reports of non-storm water discharge, and annual reports. The City, as the Legally Responsible Party, will certify these reports after they are posted to SMARTS.
  - 4. All Water Board fees for SWPPP-related tasks and posts shall be included in the Contractor's bid for this item of work.

*1.14 USE OF SITE AND OTHER AREAS*

- A. The Contractor shall effectively secure and protect adjacent property and structures, crops and other vegetation.
- B. Contractor shall repair all fences damaged during the work.
- C. In all cases where the Contractor removes fences to obtain room to work, he shall provide and install temporary fencing as required. Prior to completion of

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construction, the Contractor shall restore all original fences to the satisfaction of the Engineer. All costs of providing, work required for site maintenance and maintaining and restoring gates and fencing shall be borne by the Contractor.

- D. The Contractor shall use extreme care during construction to prevent damage from dust to crops and adjacent property. The Contractor shall also abate dust nuisance by cleaning, sweeping and sprinkling with water or other means as necessary. Dust control shall conform to the applicable provisions of Section 10-5 of the State Standard Specifications. All cleanup, dust control, and project site maintenance costs shall be absorbed in the Contractor's Bid.
- E. The Contractor shall be responsible for all damage to any property resulting from trespass by the Contractor or his employees in the course of their employment, whether such trespass was committed with or without the consent or knowledge of the Contractor.
- F. The Contractor shall provide and maintain enclosed toilets for the use of employees engaged in the Work. These accommodations shall be maintained in a neat and sanitary condition. They shall also comply with all applicable laws, ordinances, and regulations pertaining to the public health and sanitation of dwellings and camps.
- G. All traffic signs and street signs within the limits of the improvement shall be removed, salvaged and stockpiled at locations designated by the Engineer. Traffic control signs and street signs will be replaced upon the completion of the Work and the cost of removal and replacement will be included in various bid items, and no separate payment will be made as such.
- H. Compensation for any necessary work required for site maintenance shall be considered as included in the prices paid for the various bid items and no additional compensation will be made therefore.

*1.15 EMERGENCIES*

- A. In the event of an emergency or unusual conditions endangering life, the Work, or adjacent property, the Contractor may, without special instructions or authorization, act at his discretion to prevent or eliminate such danger. If the Engineer determines that a change in the Contract Documents is required due to the action taken by the Contractor in response to such an emergency, a change order will be issued.

*1.16 AIR POLLUTION CONTROL*

- A. The Contractor shall not discharge smoke, dust or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority.
- B. Contractor shall comply with the San Joaquin Valley Air Pollution Control District (SJVAPCD) Regulation VIII. Dust control shall be as specified in Section 01 57 27 – Dust Control.
- C. Contractor shall comply with all applicable standards, orders, or regulations issued pursuant to the Clean Air Acts of 1970 and Cal OSHA.

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*1.17 PROJECT SITE SECURITY*

- A. The Contractor shall secure the project site at all times when work is not in progress. It shall be his responsibility to protect existing and newly construction facilities from damage due to his construction operations and shall be responsible for the repair or replacement of any facilities which are damaged due to his failure to secure the project site.
- B. Contractor shall make his own arrangements, pay for and assume all responsibility for acquiring, using and disposing of additional work areas and facilities temporarily required by him. He shall indemnify and hold the Owner harmless from all claims for damages occasioned by such actions.

*1.18 NOTIFICATION*

- A. The Owner shall be supplied at all times with the names and telephone numbers of at least two (2) persons in charge of or responsible for the work, who can be reached for emergency work twenty-four (24) hours a day, seven (7) days a week.

An Emergency Contact List with contact numbers and addresses for the Sheriff, Police, Fire Department, the names and telephone numbers of at least two (2) medical doctors practicing in the vicinity and the local ambulance service shall be prominently displayed adjacent to telephones.

- B. The Contractor shall notify the Owner at least forty-eight (48) hours prior to commencing work.
- C. Contractor shall notify USA Underground Service Alert Organization for utility underground permits per Section 4216 of the government Code. The Contractor shall obtain all identification numbers and certifications required for underground utility locations prior to starting excavation within the project limits of work. The Underground Service Alert Phone Number is 800-227-2600. The Contractor shall immediately notify the District and the utility owner if he/she disturbs, disconnects, or damages any utility.

*1.19 LABOR*

- A. No person whose age or physical condition is such as to make his employment dangerous to his health and safety or to the health and safety of others shall be employed on the Work, and in no event shall any person under the age of sixteen (16) years be employed.

**END SECTION**

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**SECTION 00 52 19**  
**OWNER'S RIGHTS AND RESPONSIBILITIES**

**PART 1 GENERAL**

*1.1 COMMUNICATION TO CONTRACTOR*

- A. Except as otherwise provided in these Contract Documents, Owner shall issue all communications to Contractor through Engineer.
- B. Contractor's sole point of contact shall be Engineer or Engineer's designated representative.

*1.2 LAND AND EASEMENTS*

- A. Owner will provide clear title and full access to the project site for Contractor's use, throughout the duration of the Project.

*1.3 DEFFECTIVE WORK*

- A. If Contractor fails to correct defective work promptly after receipt of notice by the Owner or Engineer, Owner may order defective work done by others after seven days' written notice to Contractor for remedy or correction of any such deficiency.
- B. All claims, costs, losses, and damages sustained by Owner in exercising the right to remedy deficiencies, will be charged against the Contractor.

*1.4 LIMITATIONS ON OWNER'S RESPONSIBILITIES*

- A. The Owner shall not supervise, direct, or have control or authority over, nor be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.
- B. Owner will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.

**END SECTION**

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**SECTION 00 52 21**  
**WAIVER AND RELEASE SUBMITTALS**

1.1 *GENERAL INSTRUCTIONS FOR WAIVER AND RELEASE  
(LIEN WAIVER) SUBMITTALS*

- A. Waivers and Releases must be submitted, on forms provided by Owner or on equivalent forms supplied by Contractor. Copies of said forms, which comply with Civil Code Sections 8132 through 8138, are attached at the end of this Section.
- B. Comply with Section 01 20 00 - Measurement and Payment.
- C. Waiver and Release submittal sequence:
  - 1. Upon initial submittal for progress payment, submit for each subcontractor, material or equipment supplier a "**Conditional Waiver And Release Upon Progress Payment**". If initial submittal is also a final submittal for any or all subcontractors, material or equipment suppliers, submit a "**Conditional Waiver And Release Upon Final Payment**" for those suppliers or subcontractors.
  - 2. Upon each subsequent submittal for progress payment, submit for each subcontractor, material or equipment supplier a "**Conditional Waiver And Release Upon Progress Payment**" for the total amount through the current progress payment. Also submit an "**Unconditional Waiver And Release Upon Progress Payment**" reflecting the previous progress payment aggregate sum.
  - 3. Upon submittal for final progress payment, submit for each subcontractor, material or equipment supplier a "**Conditional Waiver And Release Upon Final Payment**". Also submit an "**Unconditional Waiver And Release Upon Progress Payment**" reflecting the previous progress payment aggregate sum.
  - 4. Prior to final payment, submit for each subcontractor, material or equipment supplier a "**Conditional Waiver And Release Upon Final Payment**".
  - 5. Upon receipt of final payment, Contractor shall submit an "**Unconditional Waiver And Release Upon Final Payment**".

**END SECTION**

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**CONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

**Identifying Information**

Name of Claimant: \_\_\_\_\_

Name of Customer: \_\_\_\_\_

Job Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Through Date: \_\_\_\_\_

**Conditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: \_\_\_\_\_

Amount of Check: \$ \_\_\_\_\_

Check Payable to: \_\_\_\_\_

**Exceptions**

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

Date(s) of waiver and release: \_\_\_\_\_

Amount(s) of unpaid progress payment(s): \$ \_\_\_\_\_

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(4) Contract rights, including (A) a right based on rescission, abandonment, or breach of contract, and (B) the right to recover compensation for work not compensated by the payment.

**Signature**

Claimant's Signature: \_\_\_\_\_

Claimant's Title: \_\_\_\_\_

Date of Signature: \_\_\_\_\_

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**UNCONDITIONAL WAIVER AND RELEASE UPON PROGRESS PAYMENT**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

**Identifying Information**

Name of Claimant: \_\_\_\_\_

Name of Customer: \_\_\_\_\_

Job Location: \_\_\_\_\_

Owner: \_\_\_\_\_

Through Date: \_\_\_\_\_

**Unconditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job through the Through Date of this document. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has received the following progress payment: \$ \_\_\_\_\_

**Exceptions**

This document does not affect any of the following:

- (1) Retentions.
- (2) Extras for which the claimant has not received payment.
- (3) The following progress payments for which the claimant has previously given a conditional waiver and release but has not received payment:

**Signature**

Claimant's Signature: \_\_\_\_\_

Claimant's Title: \_\_\_\_\_

Date of Signature: \_\_\_\_\_

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**CONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT**

NOTICE: THIS DOCUMENT WAIVES THE CLAIMANT'S LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS EFFECTIVE ON RECEIPT OF PAYMENT. A PERSON SHOULD NOT RELY ON THIS DOCUMENT UNLESS SATISFIED THAT THE CLAIMANT HAS RECEIVED PAYMENT.

**Identifying Information**

Name of Claimant: \_\_\_\_\_

Name of Customer: \_\_\_\_\_

Job Location: \_\_\_\_\_

Owner: \_\_\_\_\_

**Conditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. This document is effective only on the claimant's receipt of payment from the financial institution on which the following check is drawn:

Maker of Check: \_\_\_\_\_

Amount of Check: \$ \_\_\_\_\_

Check Payable to: \_\_\_\_\_

**Exception**

This document does not affect any of the following:

Disputed claims for extras in the amount of: \$ \_\_\_\_\_

**Signature**

Claimant's Signature: \_\_\_\_\_

Claimant's Title: \_\_\_\_\_

Date of Signature: \_\_\_\_\_

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**UNCONDITIONAL WAIVER AND RELEASE UPON FINAL PAYMENT**

NOTICE TO CLAIMANT: THIS DOCUMENT WAIVES AND RELEASES LIEN, STOP PAYMENT NOTICE, AND PAYMENT BOND RIGHTS UNCONDITIONALLY AND STATES THAT YOU HAVE BEEN PAID FOR GIVING UP THOSE RIGHTS. THIS DOCUMENT IS ENFORCEABLE AGAINST YOU IF YOU SIGN IT, EVEN IF YOU HAVE NOT BEEN PAID. IF YOU HAVE NOT BEEN PAID, USE A CONDITIONAL WAIVER AND RELEASE FORM.

**Identifying Information**

Name of Claimant: \_\_\_\_\_

Name of Customer: \_\_\_\_\_

Job Location: \_\_\_\_\_

Owner: \_\_\_\_\_

**Unconditional Waiver and Release**

This document waives and releases lien, stop payment notice, and payment bond rights the claimant has for all labor and service provided, and equipment and material delivered, to the customer on this job. Rights based upon labor or service provided, or equipment or material delivered, pursuant to a written change order that has been fully executed by the parties prior to the date that this document is signed by the claimant, are waived and released by this document, unless listed as an Exception below. The claimant has been paid in full.

Maker of Check: \_\_\_\_\_

Amount of Check: \$ \_\_\_\_\_

Check Payable to: \_\_\_\_\_

**Exception**

This document does not affect any of the following:

Disputed claims for extras in the amount of: \$ \_\_\_\_\_

**Signature**

Claimant's Signature: \_\_\_\_\_

Claimant's Title: \_\_\_\_\_

Date of Signature: \_\_\_\_\_

WAIVER AND RELEASE SUBMITTALS  
00 52 21-7

LOWER TULE IRRIGATION DISTRICT  
TIPTON PIPELINE

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WAIVER AND RELEASE SUBMITTALS  
00 52 21-8

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 55 00**  
**NOTICE TO PROCEED**

**TO: (Successful Bidder)**

**PROJECT:** Lower Tule River Irrigation District  
Tipton Pipeline

**DATE:**

This Notice to Proceed is issued pursuant to the Contract dated \_\_\_\_\_. You are hereby notified to commence work on or before \_\_\_\_\_, and you are to complete the WORK within Ninety (90) consecutive calendar days from that date.

**The date of completion of all WORK is therefore \_\_\_\_\_.**

OWNER – Lower Tule River Irrigation District

By: \_\_\_\_\_  
Eric Limas

**ACCEPTANCE OF NOTICE**

Receipt of the above Notice to Proceed is hereby acknowledged by \_\_\_\_\_ this \_\_\_\_\_ day of \_\_\_\_\_, 2024.

By: \_\_\_\_\_

Title: \_\_\_\_\_

**END SECTION**

NOTICE TO PROCEED  
00 55 00-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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NOTICE TO PROCEED  
00 55 00-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 61 00**  
**BOND REQUIREMENTS**

**PART 1 GENERAL**

**1.1 GENERAL**

- A. The following bonds are required as part of this project:
1. Bid Bond, in accordance with Specification Section 00 43 13. The principal sum shall be in the amount of 10 percent (10%) of the amount of the base bid.
  2. Performance Bond, in accordance with Specification Section 00 61 13. The principal sum shall be in the amount of 100 percent (100%) of the amount of the contract awarded.
  3. Payment Bond, in accordance with Specification Section 00 61 16. The principal sum shall be in the amount of 100 percent (100%) of the amount of the contract awarded.
  4. Warranty Bond, in accordance with Specification Section 00 65 38. The principal sum shall be in the amount of 25 percent (25%) of the amount of the contract awarded.
- B. All bonds shall be issued by an admitted surety insurer.
- C. The payment and performance bonds required by these specifications will neither be accepted nor approved by the Owner unless the bonds are underwritten by an admitted surety and the requirements of California Code of Civil Procedure Section 995.630 are met.
- D. The Owner further reserves the right to satisfy itself as to the acceptability of the surety and the form of bond.
- E. **Upon request by the Owner, the Bidder shall submit the following documents:**
1. The original, or a certified copy, of the unrevoked appointment, power of attorney, bylaws, or other instrument authorizing the person who executed the bond to do so.
  2. A certified copy of the certificate of authority of the insurer issued by the California Insurance Commissioner.
  3. A certificate from the county clerk that the certificate of authority has not been surrendered, revoked, canceled, annulled, or suspended, or in the event that it has, that renewed authority has been granted.
  4. A certified copy of the certificate of the listing status from the United States Department of the Treasury circular 570, as amended.

BOND REQUIREMENTS  
00 61 00-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

5. A financial statement of the assets and liabilities of the insurer to the end of the quarter calendar year prior to 30 days next preceding the date of the execution of the bond, in the form of an officers' certificate as defined in Corporations Code Section 173.
- F. Such Bonds shall be executed by the Contractor and a corporate bonding company licensed to transact such business in the state in which the work is to be performed and named on the current list of "Surety Companies Acceptable on Federal Bonds" as published in the Treasury Department Circular Number 570.
- G. The expense of these Bonds shall be borne by the Contractor.
- H. If at any time a Surety on any such Bond is declared a bankrupt or loses its right to do business in the state in which the Work is to be performed or is removed from the list of surety companies accepted on Federal Bonds, Contractor shall within twenty (20) days after notice from the Owner to do so, substitute an acceptable Bond (or Bonds) in such form and sum and signed by such other Surety or Sureties as may be satisfactory to the Owner.
  1. The premiums on such Bond shall be paid by the Contractor.
  2. No further payment shall be deemed due nor shall be made until the new Surety or Sureties shall have furnished an acceptable Bond to the Owner.

**END SECTION**

**BOND REQUIREMENTS**  
00 61 00-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 61 13**  
**PERFORMANCE BOND**

KNOW ALL MEN BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a \_\_\_\_\_, hereinafter called Principal, and  
(Corporation, Partnership, or Individual)

\_\_\_\_\_  
(Name of Surety)

an admitted California Surety, California Certificate No.: \_\_\_\_\_

\_\_\_\_\_  
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto Lower Tule River Irrigation District, hereinafter called Owner, in the penal sum of \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is hereto attached and made a part hereof for the construction of:

**Tipton Pipeline**

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties, all the undertakings, covenants, terms, conditions and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder of the Specifications accompanying the same shall release or otherwise

PERFORMANCE BOND  
00 61 13-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

affect its obligation on this Bond, and it does hereby 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.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed, this the \_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Principal

By \_\_\_\_\_ (s)

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
(Principal) Secretary

(SEAL)

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Surety

By \_\_\_\_\_ (s)  
Attorney-in-Fact

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
(Surety) Secretary

(SEAL)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
Address

*NOTES: Date of bond must not be prior to date of Contract.  
If Contractor is a partnership, all partners must execute Bond.*

PERFORMANCE BOND  
00 61 13-2



LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**END SECTION**

PERFORMANCE BOND  
00 61 13-3

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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PERFORMANCE BOND  
00 61 13-4

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 61 16  
PAYMENT BOND**

KNOW ALL MEN BY THESE PRESENTS: that

\_\_\_\_\_

\_\_\_\_\_

a \_\_\_\_\_, hereinafter called Principal, and  
(Corporation, Partnership, or Individual)

\_\_\_\_\_

an admitted California Surety, California Certificate No.: \_\_\_\_\_

\_\_\_\_\_

hereinafter called Surety, are held and firmly bound unto Lower Tule River Irrigation District, hereinafter called Owner, in the penal sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, a copy of which is hereto attached and made a part hereof for the construction of:

**Tipton Pipeline**

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the work provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor performed in such work, whether by subcontractor or otherwise, then this obligation shall be void, otherwise, to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety, for value received hereby stipulates and agrees that no change, extension of time alternation or addition to the terms of the Contract or to work to be performed thereunder of the Specifications accompanying the same shall release or otherwise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

PAYMENT BOND  
00 61 16-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed, this the \_\_\_ day of \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
Principal

By \_\_\_\_\_ (s)

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
(Principal) Secretary

(SEAL)

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Surety

By \_\_\_\_\_ (s)  
Attorney-in-Fact

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
(Surety) Secretary

(SEAL)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
Address

*NOTES: Date of bond must not be prior to date of Contract.  
If Contractor is a partnership, all partners must execute Bond.*

**END SECTION**

PAYMENT BOND  
00 61 16-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 63 63  
CHANGE ORDER**

**Change Order  
No. \_\_\_\_\_**

Owner: \_\_\_\_\_ Owner's Project No.: \_\_\_\_\_  
 Engineer: \_\_\_\_\_ Engineer's Project No.: \_\_\_\_\_  
 Contractor: \_\_\_\_\_ Contractor's Project No.: \_\_\_\_\_  
 Project: \_\_\_\_\_  
 Contract Name: \_\_\_\_\_  
 Date Issued: \_\_\_\_\_ Effective Date of Change Order: \_\_\_\_\_

The Contract is modified as follows upon execution of this Change Order:

Description:  
**[Description of the change]**

Attachments:  
**[List documents related to the change]**

<b>Change in Contract Price</b>	<b>Change in Contract Times</b>
Original Contract Price:  \$ _____	Original Contract Times: Substantial Completion: _____ Ready for final payment: _____
<b>[Increase] [Decrease]</b> from previously approved Change Orders No. 1 to No. <b>[Number of previous Change Order]</b> :  \$ _____	<b>[Increase] [Decrease]</b> from previously approved Change Orders No.1 to No. <b>[Number of previous Change Order]</b> : Substantial Completion: _____ Ready for final payment: _____
Contract Price prior to this Change Order:  \$ _____	Contract Times prior to this Change Order: Substantial Completion: _____ Ready for final payment: _____
<b>[Increase] [Decrease]</b> this Change Order:  \$ _____	<b>[Increase] [Decrease]</b> this Change Order: Substantial Completion: _____ Ready for final payment: _____
Contract Price incorporating this Change Order:	Contract Times with all approved Change Orders: Substantial Completion: _____

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

\$ _____	Ready for final payment: _____
----------	--------------------------------

	Recommended by Engineer (if required)	Authorized by Owner
By:	_____	_____
Title:	_____	_____
Date:	_____	_____
	Authorized by Owner	Approved by Funding Agency (if applicable)
By:	_____	_____
Title:	_____	_____
Date:	_____	_____

CHANGE ORDER  
00 63 63-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**Change Order  
Instructions**

**A. GENERAL INFORMATION**

This document was developed to provide a uniform format for handling contract changes that affect Contract Price or Contract Times. Changes that have been initiated by a Work Change Directive must be incorporated into a subsequent Change Order if they affect Price or Times.

Changes that affect Contract Price or Contract Times should be promptly covered by a Change Order. The practice of accumulating Change Orders to reduce the administrative burden may lead to unnecessary disputes.

If Milestones have been listed in the Agreement, any effect of a Change Order thereon should be addressed.

For supplemental instructions and minor changes not involving a change in the Contract Price or Contract Times, a Field Order should be used.

**B. COMPLETING THE CHANGE ORDER FORM**

Engineer normally initiates the form, including a description of the changes involved and attachments based upon documents and proposals submitted by Contractor, or requests from Owner, or both.

Once Engineer has completed and signed the form, all copies should be sent to Owner or Contractor for approval, depending on whether the Change Order is a true order to the Contractor or the formalization of a negotiated agreement for a previously performed change. After approval by one contracting party, all copies should be sent to the other party for approval. Engineer should make distribution of executed copies after approval by both parties.

If a change only applies to price or to times, cross out the part of the tabulation that does not apply.

**END SECTION**

CHANGE ORDER  
00 63 63-3

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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CHANGE ORDER  
00 63 63-4



LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 64 00**  
**CLAIMS AND DISPUTE RESOLUTION**

**PART 1 GENERAL**

*1.1 CLAIMS RESOLUTION PROCESS*

- A. In accordance with Public Contract Code section 9204, should Contractor make a claim for (1) a time extension, including, without limitation, for relief from damages or penalties for delay assessed by the Owner; (2) payment by the Owner of money or damages arising from the work done by, or on behalf of, the Contractor pursuant contract, payment for which is not otherwise expressly provided or to which the claimant is not otherwise entitled; or (3) payment by the Owner of an amount that is disputed by the Owner, the Contractor shall send a demand by registered mail or certified mail with return receipt requested to the Owner.
- B. Upon receipt of a claim, the Owner shall conduct a reasonable review of the claim and, within a period not to exceed forty-five (45) calendar days, shall provide the Contractor a written statement identifying what portion of the claim is disputed and what portion is undisputed. Upon receipt of a claim, the Owner and Contractor may, by mutual agreement, extend the time period provided in this subdivision. The Contractor shall furnish reasonable documentation to support its claim.
- C. If the Owner 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 Owner's governing body does not meet within the forty-five (45) calendar 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 Owner shall have up to three (3) calendar days following the next duly publicly noticed meeting of the Owner's governing body after the forty-five (45) calendar 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 sixty (60) calendar days after the Owner issues its written statement.
- D. If the Contractor disputes the Owner's written response, or if the Owner fails to respond to a claim within the time prescribed, the Contractor may demand in writing an informal conference to meet and confer for settlement of the issues in dispute.
- E. Upon receipt of a demand in writing sent by registered mail or certified mail, return receipt requested, the Owner shall schedule a meet and confer conference within thirty (30) calendar days for settlement of the dispute.
- F. Within ten (10) working days following the conclusion of the meet and confer conference, if the claim or any portion of the claim remains in dispute, the Owner shall provide the Contractor 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 sixty (60) calendar days after the Owner issues its written statement.

CLAIMS AND DISPUTE RESOLUTION  
00 64 00-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

- G. Any disputed portion of the claim, as identified by the Contractor in writing, shall be submitted to nonbinding mediation, with the Owner and the Contractor sharing the associated costs equally. The Owner and the Contractor shall mutually agree to a mediator within ten (10) working 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. 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 as may be provided in the Contract Documents. Unless otherwise agreed to by the Owner and the Contractor in writing, the mediation conducted pursuant to this section shall excuse any further obligation under Public Contract Code section 20104.4 to mediate after litigation has been commenced. This section does not preclude the Owner 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.
- H. Failure by the Owner to respond to a claim from the Contractor within the time periods described in this section or 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 Owner'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.
- I. Amounts not paid in a timely manner as required by this section shall bear interest at 7 percent (7%) per annum.
- J. If a subcontractor or a lower tier subcontractor lacks legal standing to assert a claim against the Owner because privity of contract does not exist, the Contractor may present to the Owner 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 Owner shall furnish reasonable documentation to support the claim. Within forty-five (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 Owner and, if the Contractor did not present the claim, provide the subcontractor with a statement of the reasons for not having done so.
- K. 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) the Owner 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

CLAIMS AND DISPUTE RESOLUTION  
00 64 00-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

provisions do not conflict with or otherwise impair the timeframes and procedures set forth in this section.

**END SECTION**

CLAIMS AND DISPUTE RESOLUTION  
00 64 00-3

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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CLAIMS AND DISPUTE RESOLUTION  
00 64 00-4

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 65 16**  
**CERTIFICATE OF SUBSTANTIAL COMPLETION**

Owner:  
Engineer:

Owner's Project No.:  
Engineer's Project No.:  
Contractor's Project  
No.:

Contractor:  
Project:  
Contract  
Name:

This  Preliminary  Final Certificate of Substantial Completion applies to:  
 All Work  The following specified portions of the Work:

**[Describe the portion of the work for which Certificate of Substantial Completion is issued]**

Date of Substantial Completion: **[Enter date, as determined by Engineer]**

The Work to which this Certificate applies has been inspected by Owner, Contractor, and Engineer, and found to be substantially complete. The Date of Substantial Completion is hereby established, subject to the provisions of the Contract. The date of Substantial Completion marks the commencement of the contractual correction period and applicable warranties required by the Contract.

A punch list of items to be completed or corrected is attached to this Certificate. This list may not be all-inclusive, and the failure to include any items on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Amendments of contractual responsibilities recorded in this Certificate should be the product of mutual agreement of Owner and Contractor.

The responsibilities between Owner and Contractor for security, operation, safety, maintenance, heat, utilities, insurance, and warranties upon Owner's use or occupancy of the Work must be as provided in the Contract, except as amended as follows:

Amendments to Owner's Responsibilities:  None  As follows:

**[List amendments to Owner's Responsibilities]**

Amendments to Contractor's Responsibilities:  None  As follows:

**[List amendments to Contractor's Responsibilities]**

The following documents are attached to and made a part of this Certificate:

**[List attachments such as punch list; other documents]**

This Certificate does not constitute an acceptance of Work not in accordance with the Contract Documents, nor is it a release of Contractor's obligation to complete the Work in accordance with the Contract Documents.

By Engineer (*signature*): \_\_\_\_\_

Name (*printed*): \_\_\_\_\_

Title: \_\_\_\_\_

CERTIFICATE OF SUBSTANTIAL COMPLETION  
00 65 16-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**END SECTION**

CERTIFICATE OF SUBSTANTIAL COMPLETION  
00 65 16-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 65 36**  
**GUARANTY**

The Contractor shall remain responsible for all defects in the Work, for a period of one (1) year following completion and acceptance of the Work by the Owner. Should any of the materials or equipment prove defective or should the Work as a whole prove defective, due to faulty techniques, material furnished or methods of installation, or should the Work or any part thereof fail to operate properly as originally intended and in accordance with the Plans and Specifications, the undersigned agrees to, upon demand by the Owner, replace any such materials and repair said work completely and without cost to the Owner, so that said work will function successfully as originally contemplated, or, upon demand, reimburse the Owner for its expenses incurred in restoring said Work to the condition contemplated in said project, including the cost of any such equipment or materials replaced and the cost of removing and replacing any other work necessary to make such replacement or repairs.

The Owner shall have the unqualified option to make any needed replacement or repairs itself or to have such replacements or repairs done by the undersigned. In the event the Owner elects to have said work performed by the undersigned, the undersigned agrees that the repairs shall be made and such materials as are necessary shall be furnished and installed within a reasonable time after receipt of demand from the Owner. If the undersigned shall fail or refuse to comply with his obligations under this guaranty, the Owner shall be entitled to all costs and expenses, including attorney's fees, reasonably incurred by reason of the said failure or refusal.

Prior to Owner exercising the option to have such repair or replacement performed by others, Owner shall notify undersigned of Owner's intent. Undersigned shall have 10 days to inspect the defective Work, materials and/or equipment and ascertain its condition. Full compensation for furnishing the guaranty will be considered as included in the contract price or prices paid for the items of work involved and no additional compensation will be allowed therefore.

Date: \_\_\_\_\_

\_\_\_\_\_  
Contractor

**END SECTION**

GUARANTY  
00 65 36-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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GUARANTY  
00 65 36-2



LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**SECTION 00 65 38  
WARRANTY BOND**

KNOW ALL MEN BY THESE PRESENTS: that

\_\_\_\_\_  
(Name of Contractor)

\_\_\_\_\_  
(Address of Contractor)

a \_\_\_\_\_, hereinafter called Principal, and  
(Corporation, Partnership, or Individual)

\_\_\_\_\_  
(Name of Surety)

an admitted California Surety, California Certificate No.: \_\_\_\_\_

\_\_\_\_\_  
(Address of Surety)

hereinafter called Surety, are held and firmly bound unto Lower Tule River Irrigation District, hereinafter called Owner, in the penal sum of \_\_\_\_\_ Dollars

(\$ \_\_\_\_\_) in lawful money of the United States, for the payment of which sum well and truly to be made, Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that whereas, the Principal entered into a certain contract with the Owner, dated the \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_ a copy of which is hereto attached and made a part hereof for the construction of:

**Tipton Pipeline**

NOW THEREFORE, if the Principal shall well, truly and faithfully perform its duties in making all necessary repairs, replacement, corrections or adjustments during the Warranty Period, all the undertakings, covenants, terms, conditions and agreements of said contract during the original term thereof, and any extensions thereof which may be granted by the Owner, with or without notice to the Surety, and if he shall satisfy all claims and demands incurred under such contract, and shall fully indemnify and save harmless the Owner from all costs and damages which it may suffer by reason of failure to do so, and shall reimburse and repay the Owner all outlay and expense which the Owner may incur in making good any default, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER that the said Surety, for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder of the Specifications accompanying the same shall release or otherwise

WARRANTY BOND  
00 65 38-1

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

affect its obligation on this Bond, and it does hereby 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.

PROVIDED, FURTHER, that no final settlement between the Owner and the Contractor shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed, this the \_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

\_\_\_\_\_  
Principal

By \_\_\_\_\_ (s)

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
(Principal) Secretary

(SEAL)

\_\_\_\_\_  
Witness as to Principal

\_\_\_\_\_  
Address

\_\_\_\_\_  
Surety

By \_\_\_\_\_ (s)  
Attorney-in-Fact

\_\_\_\_\_  
Address

ATTEST:

\_\_\_\_\_  
(Surety) Secretary

(SEAL)

\_\_\_\_\_  
Witness as to Surety

\_\_\_\_\_  
Address

*NOTE: Date of bond must not be prior to date of Contract.  
If Contractor is Partnership, all partners should execute Bond.*

WARRANTY BOND  
00 65 38-2

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

**END SECTION**

WARRANTY BOND  
00 65 38-3

LOWER TULE RIVER IRRIGATION DISTRICT  
TIPTON PIPELINE

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LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 00 72 00**  
**GENERAL CONDITIONS**

**PART 1 GENERAL**

- 1.1 The General Conditions for this Project shall be Chapters 1 through 9, inclusive, of the most recent California State Standard Specifications of the California Department of Transportation insofar as the same may apply and in accordance with Divisions 0 and 1 of these Specifications.
- 1.2 In case of conflict between the General Conditions and these Specifications, the order of precedence is set forth in paragraph 1.1 D of Section 01 00 05, Specifications, of these Specifications.

**END SECTION**

**GENERAL CONDITIONS**  
**00 72 00-1**

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GENERAL CONDITIONS  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 00 72 20**  
**LEGAL RELATIONS AND RESPONSIBILITIES**

**PART 1 GENERAL**

- 1.1 The following sections detail changes that shall apply to the State Standard Specifications, Chapter 7.
- 1.2 Contractor is advised that he shall be responsible to follow and abide by all applicable state laws, whether or not they are specifically cited below.

**PART 2 CHANGES TO STATE STANDARD SPECIFICATIONS**

- 2.1 **CERTIFIED PAYROLL RECORDS.** - Section 7-1.02K(3) provides email addresses for submittal of certified payroll records. These are not correct for the subject project. All certified payrolls shall be submitted electronically to the California Department of Industrial Relations per the DIR requirements, with an electronic copy to the Lower Tule River Irrigation District.

All other rules for certified payrolls remain the same.

- 2.2 **LAWS TO BE OBSERVED.** - the original provisions of Section 7-1.02A shall be deleted and the following substituted therefore:

**7-1.02A Laws to be Observed.** - The Contractor shall keep itself fully informed of all existing and future State and Federal laws and county and municipal ordinances and regulations which in any manner affect those engaged or employed in the Work, or the materials used in the Work, or which in any way affect the conduct of the Work, and of all such orders and decrees of bodies or tribunals having any jurisdiction or authority over the same. He or she shall at all times observe and comply with all such existing and future laws, ordinances, regulations, orders, and decrees of bodies or tribunals having any jurisdiction or authority over the Work; and shall indemnify the Lower Tule River Irrigation District, and all officers and employees thereof connected with the Work, including but not limited to the General Manager, against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by itself or its employees. If any discrepancy or inconsistency is discovered in the plans, drawings, specifications, or contract for the work in relation to any such law, ordinance, regulation, order, or decree the Contractor shall forthwith report the same to the Engineer in writing.

- 2.3 **INSURANCE REQUIREMENTS**

- A. Section 7-1.06B, Casualty Insurance, Section 7-1.06C, Worker's Compensation and Employer's Liability Insurance, and Sections 7-1.06D(1), Liability Insurance – General and 7-1.06D(2), Liability Limits/Additional Insureds, shall be deleted and replaced with the requirements in Section 00 73 16 of these Specifications.
- B. The remainder of Section 7-1.06 shall remain in full force and effect.

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2.4 **ADDITIONAL PROVISIONS.** - The Following Additional Paragraphs A through H, Inclusive, Shall Be Inserted at The End of Chapter 7 of The Standard Specifications:

- A. **Contractor Not Responsible For Damage Resulting From Certain Acts of God.** - As provided in Section 7105 of the California Public Contract Code, the Contractor shall not be responsible for the cost of repairing or restoring damage to the Work which damage is determined to have been proximately caused by an act of God, in excess of 5 percent of the contracted amount, provided, that the Work damaged was built in accordance with accepted and applicable building standards and the plans and specifications of the Lower Tule River Irrigation District. The Contractor shall obtain insurance to indemnify the Lower Tule River Irrigation District for any damage to the Work caused by an act of God if the insurance premium is a separate bid item in the bidding schedule for the Work. For purposes of this section, the term "acts of God" shall include only the following occurrences or conditions and effects: earthquakes in excess of a magnitude of 3.5 on the Richter Scale, and tidal waves.
- B. **Notice of Completion.** - in accordance with the Sections 3086 and 3093 of the California Civil Code, within 10 days after date of acceptance of the Work by the Lower Tule River Irrigation District Board, the Lower Tule River Irrigation District will file, In the County Recorder's office, a Notice of Completion of the Work.
- C. **Unpaid Claims.** - If, at any time prior to the expiration of the period for service of a Stop Notice, there is served upon the Lower Tule River Irrigation District a Stop Notice as provided in Sections 3179 through 3210 of the Civil Code of the State of California, the Lower Tule River Irrigation District shall, until the discharge thereof, withhold from the moneys under its control so much of said moneys due or to become due the Contractor under this Contract as shall be sufficient to answer the claim stated in such stop notice and to provide for the reasonable cost of any litigation thereunder; provided, that if the Engineer shall, in its discretion, permit the Contractor to file with the Lower Tule River Irrigation District the bond referred to In Section 3196 of the Civil Code of the State of California, said moneys shall not thereafter be withheld on account of such Stop Notice.
- D. **Retainage From Monthly Payments.** - Pursuant to Section 22300 of the California Public Contract Code, the Contractor may substitute securities for any money withheld by the Lower Tule River Irrigation District to insure performance under the Contract. At the request and expense of the Contractor, securities equivalent to the amount withheld shall be deposited with the Lower Tule River Irrigation District or with a state or federally chartered bank as the escrow agent, who shall return such securities to the Contractor upon satisfactory completion of the Contract. Deposit of securities with an escrow agent shall be subject to a written agreement for in-lieu construction payment retention provided by the Lower Tule River Irrigation District between the escrow agent and the Lower Tule River Irrigation District which provides that no portion of the securities shall be paid to the Contractor until the Lower Tule River Irrigation District has certified to the escrow agent, in writing, that the Contract has been satisfactorily completed. The Lower Tule River Irrigation District will not certify that the Contract has been satisfactorily completed until at least 30 days after filing by the Lower Tule River Irrigation District of a Notice of Completion. Securities eligible for investment under Public Contract Code Section 22300 shall be limited to those listed in Section 16430 of the Government Code and to bank or savings and loan certificates of deposit."

LEGAL RELATIONS AND RESPONSIBILITIES  
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- E. **Removal, Relocation, or Protection of Existing Utilities.** - In accordance with the provisions of Section 4215 of the California Government Code, any contract to which a public agency as defined in Section 4401 is a party, the public agency shall assume the responsibility, between the parties to the contract, for the timely removal, relocation, or protection of existing main or trunkline utility facilities located on the site of any construction project that is a subject of the contract, if such utilities are not identified by the public agency in the plans and specifications made a part of the invitation for bids. The agency will compensate the Contractor for the costs of locating, repairing damage not due to the failure of the Contractor to exercise reasonable care, and removing or relocating such utility facilities not indicated in the plans and specifications with reasonable accuracy, and for equipment on the project necessarily idled during such work.

The Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by the failure of the public agency or the owner of the utility to provide for removal or relocation of such utility facilities.

Nothing herein shall be deemed to require the public agency to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the site of the construction project can be inferred from the presence of other visible facilities, such as buildings, meter and junction boxes, on or adjacent to the site of the construction; provided, however, nothing herein shall relieve the public agency from identifying main or trunk lines in the plans and specifications.

If the Contractor while performing the contract discovers utility facilities not identified by the public agency in the contract plans or specifications, he or she shall immediately notify the public agency and utility in writing.

The public utility, where they are the owner, shall have the sole discretion to perform repairs or relocation work or permit the Contractor to do such repairs or relocation work at a reasonable price.

- F. **Contracts for Trenches or Excavations; Notice on Discovery of Hazardous Waste or Other Unusual Conditions; investigations; Change Orders; Effect on Contract.** - As required under Section 7104 of the Public Contracts Code, in any public works contract of a local public entity which involves the digging trenches or other, excavations that extend deeper than 1.2 meters (4 feet) below the surface shall be subject to the following conditions: The Contractor shall promptly, and before the following conditions are disturbed, notify the public entity in writing, of any:
- (1) Material that the Contractor believes may be material that is hazardous waste as defined in Section 25117 of the Health and Safety Code that is required to be removed to a Class I, Class II or Class III disposal site in accordance with the provisions of existing law.
  - (2) Subsurface or latent physical conditions at the site differing from those indicated.

LEGAL RELATIONS AND RESPONSIBILITIES  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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- (3) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.'

G. **Resolution of Construction Claims.** - As required under Section 20104, et seq., of the California Public Contract Code, any demand of \$375,000 or less, by the Contractor for a time extension, payment of money, or damages arising from the work done by or on behalf of the Contractor pursuant to this Contract; or payment of an amount which is disputed by the Lower Tule River Irrigation District shall be processed in accordance with the provisions of said Section 20104, et. seq., relating to informal conferences, non-binding judicially-supervised mediation, and judicial arbitration.

A single written claim shall be filed under this Article prior to the date of final payment for all demand resulting out of the Contract.

Within 30 days of the receipt of the claim, the Lower Tule River Irrigation District may request additional documentation supporting the claim or relating to defenses or claims the Lower Tule River Irrigation District may have against the Contractor. If the amount of the claim is less than \$50,000, the Contractor shall respond to the request for additional information within 15 days after receipt of the request. The Contractor shall respond to the request within 30 days or receipt if the amount of the claim exceeds \$50,000, but is less than \$375,000.

Unless further documentation is requested, the Lower Tule River Irrigation District shall respond to the claim within 45 days if the amount of the claim is less than \$50,000, or within 60 days if the amount of the claim is more than \$50,000 but less than \$375,000. If further documentation is requested, the Lower Tule River Irrigation District shall respond within the same amount of time taken by the Contractor to respond, or 15 days, whichever is greater, after receipt of the information if the claim is less than \$50,000, If the claim is more than \$50,000 but less than \$375,000 and further documentation is requested by the Lower Tule River Irrigation District, the Lower Tule River Irrigation District shall respond within the same amount of time taken by the Contractor to respond or 30 days, whichever is greater.

If the Contractor disputes the Lower Tule River Irrigation District's response, or the Lower Tule River Irrigation District fails to respond, the Contractor may demand an informal conference to meet and confer for settlement of the issues in dispute. The demand shall be served on the Lower Tule River Irrigation District within 15 days after the deadline of the Lower Tule River Irrigation District to respond or within 15 days of the Lower Tule River Irrigation District's response, whichever occurs first. The Lower Tule River Irrigation District shall schedule the meet and confer conference within 30 days of the request.

If the meet and confer conference does not produce a satisfactory request, the Contractor may pursue the remedies authorized by law.

**END SECTION**

LEGAL RELATIONS AND RESPONSIBILITIES  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 00 73 15**  
**INDEMNITY AGREEMENT**

The undersigned Contractor (or supplier) by reason of contracts or purchase orders (and addenda and riders thereto) which have or may be entered into with the designated certificate holder, agrees the following conditions shall apply with respect to any and all work performed for or materials or equipment supplied to designated certificate holder.

To the greatest extent allowed by the law, the Contractor agrees to indemnify and save harmless, the Lower Tule River Irrigation District, Provost & Pritchard Consulting Group, and each of their officers, directors, agents, employees, and consultants (collectively, Indemnitees) from and against all loss or expense (including costs and attorney fees), on account of injury or death of persons employed by the Contractor, or his sub-contractors, his or their agents or employees; injury to or death of any person; or injury to, damage or destruction of property, real or personal, including loss of use thereof. Upon demand, the Contractor shall defend any suits or actions covered by the terms of this Agreement.

Pursuant to Civil Code 2782 (A), Contractor shall have no obligation to indemnify or save harmless Indemnitees against loss or expense due to the sole active negligence or willful misconduct of the Lower Tule River Irrigation District or the Lower Tule River Irrigation District's agents, servants, or independent contractors who are directly responsible to the Lower Tule River Irrigation District, nor due to defects in design furnished by those persons.

Pursuant to Civil Code 2782 (B), Contractor shall have no obligation to indemnify or save harmless Indemnitees against loss or expense due to the active negligence of Owner.

Before commencing work, Contractor shall obtain at his own expense, and agrees to keep in effect during the life of this Contract, as a minimum requirement, insurance coverages as set forth in Section 00 73 16, Insurance Requirements.

The rights and remedies of the Lower Tule River Irrigation District provided in this section shall not be exclusive and are in addition to any other rights and remedies available by law or under this Agreement. This provision shall survive the expiration or termination of this Agreement.

DATE: \_\_\_\_\_

ACCEPTED: \_\_\_\_\_  
Owner, Partner or Officer

Witness-If Corp., Attest & Seal

COMPANY: \_\_\_\_\_

\_\_\_\_\_

**END SECTION**

**INDEMNITY AGREEMENT**  
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**SECTION 00 73 16**  
**INSURANCE REQUIREMENTS**

Before commencing work, Contractor shall obtain at his own expense, and agrees to keep in effect during the life of this Contract, as a minimum requirement, the following insurance coverages issued by a company or companies acceptable to the Owner. All insurance, excepting Workers' Compensation and Occupational Disease Insurance, shall include as additional insured: the Owner, the County of Tulare, the United States Department of Housing and Urban Development, Provost & Pritchard Consulting Group, and their officers, directors, agents, employees and consultants.

- 1) Worker's Compensation and Occupational Disease Insurance meeting the statutory requirements of the State of California; and Employer's Liability Insurance in an amount of at least \$1,000,000.00.

- 2) Comprehensive Liability Insurance with limits of:

Bodily Injury, Property Damage and Personal Injury - \$1,000,000.00 each occurrence, \$1,000,000.00 aggregate.

This insurance shall be on an occurrence basis and shall protect the Contractor against liability arising from: his operations, operations by sub-contractors, elevators, products, completed operations and contractual liability assumed under the indemnity provisions above insurance.

- 3) Automobile Liability on occurrence basis covering all owned, non-owned, and hired automobiles for limits of liability of:

Bodily Injury and Property Damage - \$1,000,000.00 each occurrence.

- 4) Builder's Risk Insurance is not required.

Contractor's Property Damage Liability insurance shall include coverage for property damage caused by blasting, collapse, structural injuries or damage to underground utilities. The policy shall not contain the so-called "x," "c," or "u" exclusions.

The certificate of insurance shall further provide that ten days notice of cancellation or reduction in coverage shall be given the Owner.

An Additional Insured Endorsement to Contractor's Liability insurance policy naming the County, the Owner, the United States and other participating public agencies(if applicable) and all officers and employees of the above, shall also be furnished.

Provided, however, that the limits of such insurance shall not limit the extent of such assumed responsibility and liability.

**END SECTION**

INSURANCE REQUIREMENTS  
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**INSURANCE REQUIREMENTS**  
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**SECTION 01 00 05**  
**SPECIFICATIONS**

**PART 1 GENERAL**

*1.1 GENERAL*

- A. The Contractor shall keep on the job a copy of the Plans and Specifications and shall at all times give the Owner and Engineer access thereto.
- B. Anything mentioned in the Specifications and not shown on the Plans or shown on the Plans and not mentioned in the Specifications shall be of like effect as if shown or mentioned in both.
- C. The Contractor shall not take advantage of any errors, discrepancies or omissions which may exist in the Plans and Specifications but shall immediately call them to the attention of the Engineer whose interpretation or correction thereof shall be conclusive.
- D. In case of conflict between portions of the Contract Documents, the order of precedence of Contract Documents shall be:
  - First: Permits from other agencies as may be required by law.
  - Second: Addenda
  - Third: Bid Documents, Division 0
  - Fourth: Technical Specifications, Division 2 through Division 40
  - Fifth: Plans
  - Sixth: General Requirements, Division 1
  - Seventh: State Standard Specifications
  - Eighth: Reference Documents
- E. Change Orders, supplemental agreements and approved revisions to Plans and Specifications will take precedence over documents listed above. Detailed Plans shall have precedence over general Plans.
- F. Whenever any conflict appears in any portions of the Contract Documents, it shall be resolved by application of the order of precedence.

*1.2 GENERAL REQUIREMENTS AND TECHNICAL SPECIFICATIONS*

- A. For definitions of the Specifications categorized as General Requirements (Division 1) and Technical Specifications (Division 2 through Division 40) refer to Section 01 42 13 – Definitions and Abbreviations.

*1.3 REFERENCE DOCUMENTS*

- A. For a definition of Reference Documents and State Standard Specifications refer to Section 01 42 13 – Definitions and Abbreviations.

SPECIFICATIONS  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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- B. Throughout the following Specification sections, references are made to various widely published, standard and commercial specifications, manuals, or codes of technical societies, organizations, or associations. These specifications are intended to amplify the descriptions of materials, equipment, and construction systems. The Contractor shall caution each of his Subcontractors to become familiar with the contents of the pertinent portions of these Reference Documents. The following Reference Documents are the most widely used, and are cited or referred to in each of the following sections of these Specifications:
1. American Society of Testing Materials (ASTM)
  2. American National Standards Institute (ANSI)
  3. American Standards Associations (ASA)
  4. American Concrete Institute (ACI)
  5. Federal Specifications, as applicable.
  6. California Building Code
  7. California Plumbing Code
  8. Caltrans State Standard Specifications
  9. National Electric Code
  10. Construction Safety Orders of the Division of Industrial Relations latest edition.
- C. Each citation of a Reference Document shall be construed to refer to the latest published revision of such specification as of the date of the invitation for bids and to such portions of it that relate and apply directly to the material or installation called for on this job. The Engineer will give no consideration to any claimed ignorance as to what a cited Reference Document contains, since such Subcontractor on a project of this scope is deemed to be experienced and familiar with his own trade to be experienced and familiar with his own trade's generally accepted, published standards of quality.
- D. Whenever references are made to any of the above-mentioned Reference Documents or testing methods in the governing Building Codes, the requirements of those Reference Documents shall govern, insofar as they are not in contravention with maxima or minima prescribed by documents designated in the Building Code.

1.4 *LIST OF DRAWINGS*

- A. The Work shall conform to the following Drawings:

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TITLE	SHEET NUMBERS
Cover	G1
Legend & Abbreviations	G2
Notes	G3
Existing & Demo Site	C1
Site Plan	C2
STA 9+85-19+00	PP1
STA 19+00-29+00	PP2
STA 29+00-34+00	PP3
Outlet	S1
Details 1	D1
Details 2	D2
Details 3	D3

1.5 STATE STANDARD SPECIFICATIONS

- A. For the purpose of this contract, the following terms or pronouns in place of them, used throughout the State Standard Specifications and defined in Section 1, Definition of Terms, of the State Standard Specifications, shall be as follows:

<u>TERMS</u>	<u>INTERPRETATION</u>
State	Lower Tule River Irrigation District
Department	Lower Tule River Irrigation District Agency
Director	Eric Limas
Engineer	Matt Klinchuch, PE
Department of Transportation	Lower Tule River Irrigation District
Contractor	The person or persons, co-partnership or corporation, private or municipal, who have entered into a contract with the Lower Tule River Irrigation District as party or parties of the second part, or his or her legal representative.

1.6 OCCUPATIONAL SAFETY AND HEALTH ACT

- A. The applicable standards of the American National Standards Institute and the National Fire Protection Association that have been adopted are hereby made a part of these Specifications as a whole and as mentioned in the various sections.
- B. Any errors, ambiguities, or inconsistencies of these standards with either the local codes, the Specifications, or the Drawings shall be brought to the attention of the Engineer.

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*1.7 COMPLIANCE WITH ALL LAWS AND CODES*

- A. Contractor shall conform to and abide by all local city, county, state and federal laws, rules, regulations, including industrial safety laws. Such laws shall be considered as essential parts of these Specifications and, in the absence of definite requirements herein, the provisions of such rules and regulations shall be observed by the Contractor. If the Drawings and/or Specifications are at variance therewith, Contractor shall so notify Engineer promptly. Should the Contractor perform any work contrary to such laws, ordinances, rules and regulations he shall bear all costs arising therefrom.
  
- B. Where these Specifications, however, call for or describe materials workmanship or construction of a better quality, higher standard, or larger size than is required by said rules and regulations, the provisions of these Specifications shall take precedence over said rules and regulations. Contractor shall furnish, without any extra charge, all additional labor or materials, or both, when required for compliance with these rules and regulations.

**END SECTION**

**SPECIFICATIONS**  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 01 11 00**

**DESCRIPTION OF WORK AND SCHEDULE CONSTRAINTS**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The Work consists of furnishing all labor, materials and equipment necessary to construct a 24-inch diameter pipeline, metering stand and outlet into an existing recharge basin, near the City of Tipton in the County of Tulare, in accordance with the Plans and the Specifications.
- B. The primary components are generally described as follows:
  - 1. Saw cut and install 24-inch diameter pipeline in existing headwall. Furnish and install 24-Inch PVC pipeline. Construct meter box and outlet structure into existing basin.

*1.2 BEGINNING OF WORK*

- A. The Contractor shall begin work within FOURTEEN (14) calendar days after receipt of official Notice to Proceed from the Owner.

*1.3 TIME OF COMPLETION*

- A. The Contractor shall substantially complete all work within Ninety (90) calendar days unless the period for completion is extended otherwise by the Contract Documents. The work shall be finally complete within an additional thirty (30) calendar days. The Contractor shall diligently prosecute the work to completion on or before the completion date indicated on the Notice to Proceed.

*1.4 TIME CONSTRAINTS*

- A. Contractor shall supervise, inspect, and direct the Work competently and apply such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. Contractor shall be solely responsible for the specific means, methods, techniques, sequence, or procedure of construction required to complete the project as specified by the Contract Documents. Contractor shall be responsible to see that the completed Work complies accurately with the Contract Documents.

**END SECTION**

DESCRIPTION OF WORK AND SCHEDULE CONSTRAINTS  
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DESCRIPTION OF WORK AND SCHEDULE CONSTRAINTS  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 01 11 05**  
**ENGINEER'S STATUS DURING CONSTRUCTION**

**PART 1 GENERAL**

*1.1 OWNER'S REPRESENTATIVE*

- A. Engineer will be Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of Engineer as Owner's representative during construction are set forth in these Specifications and will not be changed without written consent of Owner and Engineer.

*1.2 VISITS TO SITE*

- A. Engineer will make visits to the Site at intervals appropriate to the various stages of construction as Engineer deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of Contractor's executed Work. Based on information obtained during such visits and observations, Engineer, for the benefit of Owner, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. Engineer will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. Engineer's efforts will be directed toward providing for Owner a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, Engineer will keep Owner informed of the progress of the Work and will endeavor to guard Owner against defective Work.
- B. Engineer's visits and observations are subject to all the limitations on Engineer's authority and responsibility set forth in Section 1.5, below. Particularly, but without limitation, during or as a result of Engineer's visits or observations of Contractor's Work Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work.
- C. Review of the Work by the Engineer shall not relieve the Contractor of the obligation to fulfill all conditions of the Contract.
- D. No oral or telephonic agreement or conversation with any officer, agent or employee of the Owner or the Engineer, or with the Engineer, either before or after execution of the Contract, shall affect or modify any of the terms or obligations contained in any of the Contract Documents.
- E. The Contractor shall pay the Owner for all overtime review in accordance with existing resolutions or fee schedules of the Owner, unless the charges for such inspection have been specifically waived in the Contract Documents. Overtime charges will be made for all reviews on Saturdays, Sundays and State holidays, and hours worked by the reviewer other than those of the normal working day.

ENGINEER'S STATUS DURING CONSTRUCTION  
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**1.3 AUTHORIZED VARIATIONS IN WORK**

- A. Engineer may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on Owner and also on Contractor, who shall perform the Work involved promptly. If Owner or Contractor believes that a Field Order justifies an adjustment in the Contract Price or Contract Times, or both, and the parties are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefore as provided within the Contract Documents.

**1.4 REJECTING DEFECTIVE WORK**

- A. Engineer will have authority to reject Work which Engineer believes to be defective, or that Engineer believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. Engineer will also have authority to require special inspection or testing of the Work, whether or not the Work is fabricated, installed, or completed. Neither this authority nor the Engineer's good faith judgment to reject or not reject any work shall subject the Engineer to any liability or cause of action by the Contractor, subcontractors, or any other suppliers or persons performing work on the Contract.

**1.5 LIMITATIONS ON ENGINEER'S AUTHORITY AND RESPONSIBILITIES**

- A. Engineer will not supervise, direct, control, or have authority over or be responsible for Contractor's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of Contractor to comply with Laws and Regulations applicable to the performance of the Work. Engineer will not be responsible for Contractor's failure to perform the Work in accordance with the Contract Documents.
- B. Engineer will not be responsible for the acts or omissions of Contractor or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.
- C. Engineer's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with the Contract Documents.
- D. The limitations upon authority and responsibility shall also apply to, the Engineer's field representative, known as the Resident Project Representative, if any, and assistants, if any.

**END SECTION**

ENGINEER'S STATUS DURING CONSTRUCTION  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 01 11 10**  
**COORDINATION OF WORK**

**PART 1 GENERAL**

*1.1 RESPONSIBILITY OF CONTRACTOR*

- A. If any part of the Work depends for proper execution or results upon the work of others, the Contractor shall inspect and promptly report to the Engineer any apparent discrepancies or defects in such work of others that render it unsuitable for such proper execution and results. Failure of the Contractor to so inspect and report shall constitute an acceptance of the work of others as fit and proper except as to defects which may develop in the work of others after execution of the Work by the Contractor.

*1.2 WORK INVOLVED WITH EXISTING SYSTEM*

- A. Existing materials and equipment removed not designated to be salvaged for Owner in the execution of the Work shall become the property of the Contractor and shall be removed from, and disposed of, off the site by the Contractor in an acceptable and lawful manner.

*1.3 COORDINATION OF WORK*

- A. The Contractor shall maintain overall coordination for the execution of the Work. Based on the Construction Schedule prepared in accordance with these Specifications, he shall obtain from each of his subcontractors a similar schedule and shall be responsible for all parties maintaining these schedules or for coordinating required modifications.

*1.4 OWNER FURNISHED ITEMS*

- A. No items are being furnished by the Owner for this project.

*1.5 WORK BY OTHERS*

- A. Work by others will be shown on the Master Schedule agreed to at the Pre-Construction meeting. Any delay in completion of work by others which affects Contractor's critical path schedule will be eligible for a claim for additional contract time by Contractor.
- B. The Contractor shall be responsible to coordinate integration of work by others into the final project, however the Contractor will not be responsible for the quality or completion of the actual work to be performed by others.

**END SECTION**

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COORDINATION OF WORK  
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**SECTION 01 20 00**  
**MEASUREMENT & PAYMENT**

**PART 1 GENERAL**

*1.1 MEASUREMENT*

- A. Unless otherwise specified in the Contract Documents, quantities of work shall be determined from measurements or dimensions in a horizontal plane. All measurements shall be made in accordance with United States Standard Measures and shall be measured on the basis of "in-place" quantities.
- B. After the work has been completed, the Engineer will make field measurements of unit price items in order to determine the quantities of the various items as a basis for payment. On all unit price items, the contractor will be paid for the actual amount of the work performed in accordance with the contract documents, as computed from field measurements.
- C. Work or quantities not listed in the description of bid items are considered incidental to other construction and will not be measured. Compensation for such incidental work is considered to be included in the various items of work bid.

*1.2 INCREASED OR DECREASED QUANTITIES*

- A. Increases or decreases in quantities shall be governed by the General Conditions.
- B. All written requests for adjustment shall be made no later than five working days after notification by the Engineer that the item of work is complete.

*1.3 FINAL PAY QUANTITIES*

- A. Final pay quantities shall be in accordance with the General Conditions except as modified below.
- B. Final pay quantities will be designated only in the Bid Schedule and in Section 01 22 00 – Explanation of Bid Items and are not shown on the Plans.
- C. When an item of work is designated as a Final Pay Quantity on the Bid Schedule and/or in the Explanation of Bid Items, the estimated quantity for that item of work shall be the final pay quantity, unless the dimensions of any portion of that item are revised by the Engineer, or the item or any portion of the item is eliminated.

If the dimensions of any portion of the item are revised, and the revisions result in an increase or decrease in the estimated quantity of that item of work, the final pay quantity for the item will be revised in the amount represented by the changes in the dimensions.

If a final pay item is eliminated, the estimated quantity for the item will be eliminated.

If a portion of a final pay item is eliminated, the final pay quantity will be revised in

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proportion to the bid quantity represented by the eliminated portion of the item of work.

- D. The estimated quantity for each item of work designated as a Final Pay Quantity on the Bid Schedule and/or in the Explanation of Bid Items shall be considered as approximate only, and no guarantee is made that the quantity which can be determined by computations, based on the details and dimensions shown on the plans, will equal the estimated quantity. No allowance will be made in the event that the quantity based on computations does not equal the estimated quantity.
- E. In case of discrepancy between the quantity shown on the Bid Schedule for a final pay item and the quantity or summation of quantities for the same item shown on the plans, payment will be based on the quantity shown on the Bid Schedule.

**1.4 PARTIAL PAYMENT**

- A. Attention is directed to Section 9-1.06 of the State Standard Specifications which, except as modified herein, shall apply in its entirety.
  - 1. The local agency shall withhold not less than 5 percent of the contract price until final completion and acceptance of the project.
  - 2. Partial payments for materials on hand shall not exceed one hundred percent (100%) of the value of material delivered on site, properly stored in a secured fenced area subject to, or under the control of, the owner and local agency, and unused. Contractor shall submit copies of invoices of materials to support values. Materials stored shall be installed within 60 days of delivery for payment eligibility.
- B. Payment shall not relieve the Contractor from its obligations under the Contract; nor shall such payment be construed as acceptance of any of the Work. Payment shall not be construed as transfer of ownership of any equipment or materials to the Owner. Responsibility of ownership shall remain with the Contractor who shall be obligated to protect any fully or partially completed work or structure for which payment has been made; or replace any materials or equipment to be provided under the Contract which may be damaged, lost, stolen or otherwise degraded in any way prior to acceptance of the Work, except as provided in Section 7-1.15 of the State Standard Specifications.

**PARTIAL PAYMENT**

- C. Attention is directed to Article 14.02 of Section 00 72 00, Standard Specifications, which, except as modified herein, shall apply in its entirety.
  - 1. The local agency shall withhold not less than 5 percent of the contract price until final completion and acceptance of the project.
  - 2. Partial payments for materials on hand shall not exceed one hundred percent (100%) of the value of material delivered on site, properly stored in a secured fenced area subject to, or under the control of, the owner and local agency, and unused. Contractor shall submit copies of invoices of materials to support

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values. Materials stored shall be installed within 60 days of delivery for payment eligibility.

- D. Payment shall not relieve the Contractor from its obligations under the Contract; nor shall such payment be construed as acceptance of any of the Work. Payment shall not be construed as transfer of ownership of any equipment or materials to the Owner. Responsibility of ownership shall remain with the Contractor who shall be obligated to protect any fully or partially completed work or structure for which payment has been made; or replace any materials or equipment to be provided under the Contract which may be damaged, lost, stolen or otherwise degraded in any way prior to acceptance of the Work, except as provided in Article 14 of Section 00 72 00, Standard Specifications.

1.5 *FINAL PAYMENT*

- A. Notice of Completion will be filed in the normal course of business following the first regular meeting of Lower Tule River Irrigation District Board which occurs far enough after Final Completion to allow for agendaizing Lower Tule River Irrigation District Board approval of the Notice.
- B. Final payment will be due thirty-five (35) days after the recording of the Notice of Completion by the Owner.
- C. Upon completion of the project the final contract prices shall be revised by change order, if necessary, to reflect the true quantities used at the stated unit price thereof as contained in the Bidder's Proposal hereto attached. Payments on account thereof will be made as set forth in these Specifications.
- D. The Contractor shall comply with Section 00 52 21 - Waiver and Release Submittals.

1.6 *SECURITIES IN LIEU OF RETENTION AND ESCROW AGREEMENT*

- A. At the request and expense of Contractor, securities equivalent to the amount withheld shall be deposited with Owner, or with a state or federally chartered bank in California as the escrow agent, who shall then pay those withheld moneys to Contractor. Upon satisfactory completion of the contract, the securities shall be returned to Contractor.
- B. Alternatively, Contractor may request and the Owner shall make payment of retentions earned directly to the escrow agent at the expense of Contractor. At the expense of Contractor, Contractor may direct the investment of the payments into securities and Contractor shall receive the interest earned on the investments upon the same terms provided for in this section for securities deposited by Contractor. Upon satisfactory completion of the contract, Contractor shall receive from the escrow agent all securities, interest, and payments received by the escrow agent from Owner, pursuant to the terms of this section. Contractor shall pay to each subcontractor, not later than 20 days of receipt of the payment, the respective amount of interest earned, net of costs attributed to retention withheld from each subcontractor, on the amount of retention withheld to insure the performance of Contractor.

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- C. Securities eligible for investment under this section shall include those listed in Section 16430 of the Government Code, bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by Contractor and Owner.
- D. Contractor shall be the beneficial owner of any securities substituted for moneys withheld and shall receive any interest thereon.

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**ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION**

This Escrow Agreement is made and entered into by and between \_\_\_\_\_  
\_\_\_\_\_ whose address is \_\_\_\_\_  
\_\_\_\_\_ herein after called "Owner," \_\_\_\_\_  
\_\_\_\_\_ whose address is \_\_\_\_\_  
\_\_\_\_\_ hereinafter called "Contractor" and \_\_\_\_\_  
\_\_\_\_\_ whose address is \_\_\_\_\_  
\_\_\_\_\_ hereinafter called "Escrow Agent."

For the consideration hereinafter set forth, the Owner, Contractor, and Escrow Agent agree as follows:

(1) Pursuant to Section 22300 of the Public Contract Code of the State of California, 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 Construction Contract entered into between the Owner and Contractor for \_\_\_\_\_ in the amount of \_\_\_\_\_ dated \_\_\_\_\_ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the Owner shall make payments of the retention earnings directly to the escrow agent. When the Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the Owner within 10 days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the Contract between the Owner and Contractor. Securities shall be held in the name of \_\_\_\_\_, and shall designate the Contractor as the beneficial owner.

(2) The Owner shall make progress payments to the Contractor for those funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.

(3) When the Owner makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until the time that the escrow created under this contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the Owner pays the 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 the Owner. These expenses and payment terms shall be determined by the Owner, Contractor, and Escrow Agent.

(5) The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the 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 the Owner to the Escrow Agent that Owner consents to the withdrawal of the amount sought to be withdrawn by Contractor.

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(7) The Owner shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven days' written notice to the Escrow Agent from the owner of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the Owner.

(8) Upon receipt of written notification from the Owner certifying that the Contract is final and complete, and that the 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 the written notifications from the Owner and the Contractor pursuant to Sections (5) to (8), inclusive, of this agreement and the Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

(10) The names of the persons who are authorized to give written notice or to receive written notice on behalf of the Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of Owner:

On behalf of Contractor:

On behalf of Escrow Agent:

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

\_\_\_\_\_  
Address

At the time the Escrow Account is opened, the Owner and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

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Owner

Contractor

\_\_\_\_\_  
Title

\_\_\_\_\_  
Title

\_\_\_\_\_  
Name

\_\_\_\_\_  
Name

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

**END SECTION**

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**SECTION 01 22 00**  
**EXPLANATION OF BID ITEMS**

**PART 1 GENERAL**

The Contract payment for the specified items of work as set forth in the Bid Schedule shall be full compensation for furnishing all labor, materials, methods or processes, implements, tools, equipment and incidentals and for doing all work involved as required by the provisions of the Contract Documents for a complete in place and operational system.

- A. Unless otherwise specified in the Specifications, quantities of work shall be determined per each, or from measurements or dimensions in a horizontal plane. All materials shall be measured on the basis of "in place" quantities and paid for using the units listed in the bid schedule.
- B. Except as noted, the Engineer will make field measurements of unit price items in order to determine the quantities of the various items as a basis for payment. On all unit price items, the contractor will be paid for the actual amount of the work performed in accordance with the contract documents, as computed from field measurements.
  - 1. Work or quantities not listed in the description of bid items are considered incidental to other construction and will not be separately measured or paid for. Compensation for such work and/or material shall be included in the prices paid for other items of work.

1.2 *BID ITEMS*

**Bid Item 1 – Mobilization, Demobilization, Insurance, Bonds and Permits:** Payment for this item shall include full compensation for all labor, materials, tools, equipment and incidentals making up the cost of mobilization, move-in, move-out, all necessary bonds, insurance, permits, licenses, and fees required during the performance of the work as specified. This item also includes demobilization, including the removal of all equipment, supplies, personnel and incidentals from the project at the end of construction. Payment shall not exceed 10 percent of the bidders total proposal. Payment for mobilization shall be made with the first progress payment and shall not exceed 80 percent of the bid item amount. Payment for demobilization shall be made with the last progress payment and shall not be less than 20 percent of the bid item amount.

**Bid Item 2 – Worker Protection:** Payment for this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals for providing for worker protection from caving ground in excavations and other hazards that may occur during construction, in accordance with the Plans and specifications. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

**Bid Item 3 – Miscellaneous Facilities and Operations:** Payment for this item shall include full compensation for all labor, materials, tools, equipment and incidentals making up the cost of all work required for clearing and grubbing the construction

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area, de-watering, maintaining drainage, temporary storm and flood water control, construction and removal of temporary security fencing, construction of staging areas, protection of existing facilities, maintaining and providing the record documents and O&M manuals, general project clean up, and all costs for miscellaneous work shown and described in the Contract Documents, not included in other bid items. This bid item will be paid for on a Lump Sum basis, prorated based on percentage of work completed.

**Bid Item 4 – SWPPP Preparation and Implementation:** Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to provide and implement a Storm Water Pollution Prevention Plan (SWPPP) as specified. This bid item will be paid for by Lump Sum, upon completion of the SWPPP.

**Bid Item 5 – Dust Control:** Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to perform dust control measures for the project limits in accordance with these specifications. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

**Bid Item 6 – Compaction and Materials Testing:** Payment for this item shall include full compensation for all labor, materials, tools, equipment, and incidentals making up the cost of all work required for Compaction and Materials Testing. This bid item will be paid for on a Lump Sum basis, prorated based on percentage of work completed.

**Bid Item 7 – Traffic Control:** Payment under this item shall be considered full compensation for all labor, materials, tools, equipment and incidentals required to maintain traffic control measures for the project limits in accordance with the Plans and specifications. This bid item will be paid for by Lump Sum, prorated, based on percentage of contract work completed.

**Bid Item 8 – Turnout Installation into Headwall:** Payment for this item shall include full compensation for all labor, materials, tools, equipment, and incidentals making up the cost of all work required to install pipeline into the existing concrete headwall. This item also includes furnishing and installation of the canal gate as detailed in the plans and specifications. This bid item will be paid for on a Lump Sum basis, prorated based on percentage of work completed.

**Bid Item 9 – Furnish and Install 24-inch PIP SDR 41 100 PSI:** Payment for this item shall be considered full compensation for all labor, materials, tools, equipment, and incidentals required to furnish and install the 24" SDR41 PIP PVC (CL100) pipe and related appurtenances. This bid item includes furnishing and installing the 24" SDR41 PIP PVC (CL100) pipeline, associated fitting and appurtenances, thrust blocks, existing utility protection, trenching, backfill, moisture condition, compaction, pressure testing, and all other incidentals required to complete the work as detailed on the Plans and Specifications. This bid item will be paid for on a Unit Price per Lineal Foot of pipe furnished and installed.

**Bid Item 10 – Furnish and Install Flow Meter and Vault:** Payment for this item shall include full compensation for all labor, materials, tools, equipment and incidentals making up the cost of all work required to construct the flow meter vault as detailed

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in the plans and Specifications. This item includes the McCrometer 24" Ultra Mag flow meter and installation equipment in the pipeline, precast or cast-in place concrete vault and subgrade. As specified in Section 09 90 00, exposed steel shall be painted. This bid item will be paid for on a Lump Sum basis, prorated based on percentage of work completed.

**Bid Item 11 – Construct Outlet Structure:** Payment for this item shall be considered full compensation for all labor, materials, tools, equipment, and incidentals required to construct the cast-in-place concrete Outlet Structure. This item includes furnishing and installing structural rebar, construction of formwork, all control joints, expansion joints and construction joints. This bid item also includes sub-grade preparation, including excavation, cut off walls, scarification, backfill, moisture conditioning, compaction, and all other incidentals required to construct the Outlet Structure as detailed on the Plans and Specifications. This bid item will be paid by Lump Sum Basis.

**Bid Item 12 – Callison Road Crossing Demolition and Resurfacing:** Payment for this item shall include full compensation for all labor, materials, tools, equipment, Tulare County Enchormnet Permit, and incidentals making up the cost of all work required for Permanent Trench Resurfacing, including saw-cutting pavement and resurfacing as detailed in the Plans and Specifications. This bid item will be paid for on a Lump Sum basis and will be a Final Pay Item.

**END SECTION**

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EXPLANATION OF BID ITEMS  
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**SECTION 01 31 19**  
**PROJECT MEETINGS**

**PART 1 GENERAL**

*1.1 PRECONSTRUCTION CONFERENCE*

- A. Upon receipt of the Notice to Proceed, or at an earlier time if mutually agreeable, the Owner will arrange a preconstruction conference to be attended by the Contractor, Contractor's superintendent, the Owner, the Engineer or his representative, and representatives of utilities, major subcontractors, County of Tulare and others involved in the execution of the Work.
- B. The purpose of this conference shall be to establish a working understanding between the parties and to discuss the Construction Schedule, Critical Path Method format required, shop drawing submittals and processing, applications for payment and their processing, and such other subjects as may be pertinent for the execution of the Work.

*1.2 PROGRESS MEETINGS*

- A. The Engineer shall arrange and conduct progress meetings. These meetings shall be conducted weekly, unless designated otherwise and shall be attended by the Engineer or his representative, Contractor, Contractor's superintendent and representatives of all subcontractors, utilities, and others, that are active in the execution of the Work. The purpose of these meetings shall be to expedite the work of any subcontractor or other organization that is not up to schedule, resolve conflicts, and in general, coordinate and expedite the execution of the Work.
- B. The agenda of progress meetings shall include review of progress and schedule, of payment request, of the latest Construction Schedule update, and of the record documents.

*1.3 PROGRESS AND SCHEDULE REVIEW*

- A. The progress of the Work and the Construction Schedule shall be reviewed to verify:
  - 1. Actual start and finish dates of completed activities since the last progress meeting.
  - 2. Durations and progress of all activities not completed.
  - 3. Reason, time, and cost data for Change Order work that is to be incorporated into the Construction Schedule or payment request form.
  - 4. Payment due to the Contractor based on percentage complete of items in the submitted payment request.
  - 5. Reasons for, and duration of, required revisions in the Construction Schedule.

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6. After each monthly update, the Contractor shall submit to the Engineer three (3) prints of the last accepted Construction Schedule, revised in accordance with the monthly review.

*1.4 REVIEW OF PAYMENT REQUEST*

- A. The Contractor shall have his copy of the payment request and all other data required by the Contract Documents completed prior to the progress meeting. The Engineer will process Contractor's payment request after satisfactory review of the schedule update.

**PART 2 PRODUCTS**

NOT USED

**PART 3 EXECUTION**

NOT USED

**END SECTION**

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**SECTION 01 33 00**  
**SUBMITTAL PROCEDURES**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work described in this section includes general requirements and procedures related to the preparation and transmission of submittals to include Shop Drawings, Product Information, Calculations, Test Reports, Certificates, Samples, Manuals, and Record Drawings.

*1.2 RELATED WORK*

- A. General Conditions
- B. Section 01 33 01 – Master List of Submittals
- C. Section 01 31 19 – Project Meetings
- D. Section 01 77 00 – Closeout Procedures
- E. Individual equipment specifications

*1.3 GENERAL*

- A. Contractor shall have completed the following work tasks before a submittal:
  - 1. Reviewed and coordinated the Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents;
  - 2. Determined and verified all field measurements, quantities, dimensions, specified performance and design criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;
  - 3. Determined and verified the suitability of all materials and equipment offered with respect to the indicated application, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work; and
  - 4. Determined and verified all information relative to Contractor's responsibilities for means, methods, techniques, sequences, and procedures of construction, and safety precautions and programs incident thereto.

*1.4 TRANSMITTAL INFORMATION*

- A. Each submittal document shall have a separate cover or transmittal. Transmittals shall include the following identification data, as applicable:
  - 1. Submittal number

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2. Contract number
3. Project name and location
4. Product identification
5. Applicable contract drawing number, specification section, and paragraph number
6. Stamp Space: Blank space of approximately 2-1/2 inches high by 4 inches wide adjacent to the identification data to receive Engineer's status stamp.
7. Contractor's certification statement as described below:
  - a. "Certification Statement: By this submittal, we hereby represent that we have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and pertinent data and we have checked and coordinated each item with other applicable approved drawings and all Contract requirements."
  - B. With each submittal, Contractor shall give Engineer specific written notice of any variations that the Shop Drawing or Sample may have from the requirements of the Contract Documents. This notice shall be set forth in a written communication separate from the Shop Drawings or Sample submittal; and, in addition, in the case of Shop Drawings by a specific notation made on each Shop Drawing submitted to Engineer for review of each such variation.
  - C. Furnish neat, legible, and sufficiently explicit detail to enable proper review for Contract compliance.
  - D. Contractor assumes all risks of error and omission.
  - E. Work performed before acceptance, or not conforming to accepted submittals, shall be at Contractor's risk.
  - F. Submittal requirements contained in this specification are in addition to specific submittal requirements contained in individual equipment specification sections.

**1.5 LIMITATIONS OF ENGINEER'S REVIEW**

- A. Engineer's review is only for the purposes of determining if the items covered by the submittals will conform to the requirements in the Contract Documents.
- B. Engineer's review will not extend to means, methods, techniques, sequences, or procedures of construction or to safety precautions or programs incident thereto.
- C. Engineer's review of a separate item will not indicate acceptance of the assembly in which the item functions.
- D. Engineer's review of a Submittal shall not relieve Contractor from responsibility for any deviation from the requirements of the Contract Documents unless Contractor has given Engineer specific written notice of any deviation per the requirements of

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this Section. Engineer will document any such accepted variation from the requirements of the Contract Documents in a Field Order.

- E. Engineer's review of a Submittal, or of a variation from the requirements of the Contract Documents, shall not, under any circumstances, change the Contract Times or Contract Price, unless such changes are included in a Change Order.

**1.6 SUBMITTAL PROCESS**

- A. Submittals shall be sent to the Engineer electronically through email or a file transfer system agreed upon by the Owner, Engineer, and Contractor during the Preconstruction Conference.
- B. Engineer will provide timely review of Submittals in accordance with the Schedule of Submittals agreed upon by the Owner, Engineer, and Contractor during the Preconstruction Conference.
- C. Submittals will be returned, marked with one of the following classifications:
  - 1. NO EXCEPTION TAKEN: Requires no corrections, no marks.
  - 2. MAKE CORRETIONS NOTED: Requires minor corrections. Items may be fabricated as marked without further resubmission. Resubmit 2 corrected copies to the Engineer.
  - 3. REVISE AND RESUBMIT: Requires corrections. Resubmit entire submittal following original submission with corrections noted. Allow time for checking and Engineer's appropriate action.
  - 4. REJECTED: Submitted information does not comply with the Contract Documents. No items shall be fabricated. Resubmit entire submittal following original submission with corrections noted.
  - 5. INFORMATION ONLY: Items in the submittal are saved in the project file for information only but were not reviewed by the Engineer.

**PART 2 SUBMITTAL DOCUMENTS**

**2.1 SHOP DRAWINGS**

- A. When requested submit, submit two (2) sets of shop drawings.

**2.2 SAMPLES**

- A. When requested or required by individual specification sections, submit one (1) sample of each item.
- B. Samples shall be representative of the actual material proposed for use in the project and of sufficient size to demonstrate design, color, texture, and finish.
- C. Permanently attach to each sample

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1. The submittal number
  2. The contract number
  3. Project name and location
  4. Product identification
  5. Applicable contract drawing and specification section number
  6. Subcontractor's, vendor's and/or manufacturer's name, address, and telephone number.
- D. Certain samples may be tested for specific requirements by the Owner and/or Engineer prior to acceptance. Failure of sample to pass tests will be sufficient cause for refusal to consider further samples of the same brand and make.
- E. Rejected samples will be returned upon request, and resubmittals shall consist of new samples.

2.3 *RECORD DRAWINGS*

- A. Maintain 1 record copy of Contract Documents at site in good order and annotated to show revisions made during construction. Keep annotations current for possible inspection.
1. Make record drawings available to Engineer at all times during life of Contract.
  2. Drawings: Made part of record drawings and to include:
    - a. Contract Drawings: Annotate or redraft, as required, to show revisions, substitutions, variations, omissions, and discrepancies made or discovered during construction concerning location and depth of utilities, piping, ductbanks, conduits, manholes, pumps, valves, vaults, and other equipment. Make revisions and show on all drawing views with actual dimensions established to permanent points.
    - b. Working/Layout Drawings: When required as submittals, record actual layouts of conduit runs between various items of electrical equipment for power, control, and instrumentation; wire sizes, numbers, and functions; configuration of conduits; piping layouts; and duct layouts.
  3. Before preliminary inspection, furnish reproducible of record drawings. At completion of Contract and before final payment is made, furnish Engineer 1 set of reproducibles of finally accepted record drawings reflecting revisions herein described.

2.4 *OPERATION AND MAINTENANCE MANUALS*

- A. Furnish Operation and Maintenance Manuals for various types of equipment and systems, as required by Contract Documents. Operation and Maintenance Manuals shall be provided for all mechanical and electrical equipment. Unless otherwise

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indicated, furnish separate manual for each piece of equipment and system. If manual contains other items or equipment, indicate where specified items are located in manual. Include in manual complete information necessary to operate, maintain, and repair specific equipment and system furnished under this Contract, and include the following specific requirements;

1. Contents.
  - a. Table of Contents and Index.
  - b. Brief description of equipment/system and principal components.
  - c. Starting and stopping procedures, both normal and emergency.
  - d. Installation, maintenance, and overhaul instructions including detailed assembly drawings with parts list and numbers, and recommended spare parts list with recommended quantity, manufacturer's price, supplier's address, and telephone number.
  - e. Recommended schedule for servicing, including technical data sheets that indicate weights and types of oil, grease, or other lubricants recommended for use and their application procedures.
  - f. One copy of each component wiring diagram and system wiring diagram showing wire size and identification.
  - g. One accepted copy of each submittal with changes made during construction properly noted, including test certificates, characteristic curves, factory and field test results.
  - h. For electrical systems, include dimensioned installation drawings, single line diagrams, control diagrams, wiring and connection diagrams, list of material for contactors, relays and controls, outline drawings showing relays, meters, controls and indication equipment mounted on equipment or inside cubicles, control and protective schematics, and recommended relay settings.
2. Material:
  - a. Preliminary
    - 1) Submit one (1) electronic copy of the preliminary O&M manuals in searchable PDF format.
  - b. Final
    - 1) Submit one (1) electronic copy of the final O&M manuals in searchable PDF format.
    - 2) Submit two (2) hard copies of the final O&M Manual as described below:

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- a) Covers: Oil, moisture, and wear resistant 9 inches by 11-1/2 inches size.
- b) Pages: 60 pound paper 8-1/2 inches by 11 inches size with minimum of 2 punched holes 8-1/2 inches apart reinforced with plastic, cloth, or metal.
- c) Fasteners: Metal screw post or Acco metal strap type.
- d) Diagrams and Illustrations: Attach foldouts, as required.

**PART 3 EXECUTION**

*NOT USED*

**END SECTION**

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**SECTION 01 33 01**  
**MASTER LIST OF SUBMITTALS**

**PART 1 GENERAL**

A. The following submittals are required for the Work. Other submittals may be required as requested by the Owner or Owner's Representative.

1. Post-Bid Pre-Award Construction Schedule
2. Post-Award Construction Schedule
3. Contractor's Plan of Activities (submitted weekly)
4. Copies of all agency permits, including, but not limited to:
  - a. Tulare County Encroachment Permits.

LIST THEM HERE

5. Material certificates for aggregate base material as specified in Section 32 11 23 – Aggregate Base.
6. and manufacturer's installation manual for geotextile fabric as specified in Section 31 37 10 – Rip Rap.Plans and information as specified in Section 01 57 23 – Storm Water Pollution Prevention Plan.
7. Asphalt mix designs and material certificates as specified in Section 32 12 16 – Asphalt Concrete Paving.
8. Pipe manufacturer's product literature and installation manuals as specified in Section 40 05 00 – Pipe and Fittings.
9. Concrete mix designs, material certificates, admixtures, form release and curing compounds as specified in Section 03 30 00 - Cast-In-Place Concrete.
10. Product data and samples as specified in Section 09 90 00 – Painting.
11. Manufacturer's product literature and installation manuals as specified in Section 35 20 16 – Water Control Gate
12. All other administrative and conditional submittals as explained in this Section 01 33 00 – Submittal Procedures.

**END SECTION**

MASTER LIST OF SUBMITTALS  
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**SECTION 01 35 00**  
**MATERIAL SUBSTITUTION PROCEDURES**

**PART 1 GENERAL**

*1.1 GENERAL*

- A. The materials furnished and used shall be new, except as may be provided elsewhere in these Specifications, or on the Plans.
- B. All materials required to complete the work under this contract shall be furnished by the Contractor, unless otherwise stated.
- C. It shall be the duty of the Contractor to call the Engineer's attention to apparent errors or omissions and request instruction before proceeding with the Work. The Engineer may, by appropriate instructions, correct said apparent errors and omissions, which instructions shall be as binding upon the Contractor as though contained in the original Contract Documents.

*1.2 DEFINITIONS*

- A. Substitutions: Requests for changes in products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor.
- B. Revisions: Changes to Contract Documents requested by Owner or Engineer.
- C. Options: Specified options of products and construction methods included in Contract Documents.

*1.3 TRADE NAMES AND ALTERNATIVES*

- A. Wherever an article, or any class of materials, is specified by the trade name or by the name of any particular patentee, manufacturer or dealer, or by reference to the catalog of any such manufacturer or dealer, it shall be taken as intending to mean and specify the article or material described or any other equal thereto in quality, finish and durability, and equally as serviceable for the purpose for which it is or they are intended. The intent of the Plans and Specifications is to specify highest grade standard equipment, and it is not the intent of these Plans and Specifications to exclude or omit the products of any responsible manufacturer, if such products are equal in every practical respect to those mentioned herein, as determined by the Engineer.

*1.4 SAMPLES*

- A. At the option of the Engineer, the source of supply of materials for the Work shall be subject to tests and inspection before the delivery is started and before such materials are used in the Work. Samples representative of the character and quality of materials shall be submitted by the Contractor. Samples shall be of sufficient quantities or amounts for testing or examination.

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- B. All tests of materials furnished by the Contractor shall be made in accordance with the commonly recognized standards of national technical organizations, and such special methods and tests as are prescribed in the Contract Documents.
- C. The Contractor shall furnish such samples of materials as are requested by the Engineer, without charge. No material shall be used until the Engineer has had the opportunity to test or examine such materials. Samples will be secured and tested whenever necessary to determine the quality of the material. Samples and test specimens prepared at the jobsite, such as concrete test cylinders, shall be taken or prepared by the Engineer, or his designated representative, in the presence and with the assistance of the Contractor.

1.5 *SUBMITTALS*

- A. Material Submittals shall be made in accordance with Section 01 33 00 – Submittals.

1.6 *INSPECTION OF MATERIALS BY THE CONTRACTOR*

- A. Contractor shall make a close inspection of all materials as delivered, and shall promptly return all defective materials without waiting for their rejection by the Engineer.

1.7 *CERTIFICATES OF COMPLIANCE*

- A. A Certificate of Compliance may be required for certain materials and equipment that become final products of the completed Work. Certificates of Compliance shall be furnished prior to the use of any materials for which these Specifications require that such a certificate be furnished. In addition, when so authorized in these Specifications, the Engineer may permit the use of certain materials or assemblies prior to sampling and testing if accompanied by a Certificate of Compliance.
- B. The Certificate shall be signed by the manufacturer of the material or the manufacturer of assembled materials and shall state that the materials involved comply in all respects with the requirements of the Specifications.
- C. A Certificate of Compliance shall be furnished with each lot of material delivered to the Work and the lot so certified shall be clearly identified in the certificate.
- D. All materials used on the basis of a Certificate of Compliance may be sampled and tested at any time. The fact that material is used on the basis of a Certificate of Compliance shall not relieve the Contractor of responsibility for incorporating material in the Work which conforms to the requirements of the Plans and Specifications and any such material not conforming to such requirements will be subject to rejection whether in place or not.
- E. The Lower Tule River Irrigation District reserves the right to refuse to permit the use of material on the basis of a Certificate of Compliance.
  - 1. The form of the Certificate of Compliance and its disposition shall be as directed by the Engineer.

MATERIAL SUBSTITUTION PROCEDURES  
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**1.8 MANUFACTURER TESTING**

- A. At the option of the Engineer, materials and equipment to be supplied under this Contract will be tested and inspected either at their place of origin or at the site of the Work. The Contractor shall give the Engineer written notification well in advance of actual readiness of materials and equipment to be tested and inspected at point of origin.
  - 1. Satisfactory tests and inspections at the point of origin shall not be construed as a final acceptance of the materials and equipment nor shall such tests and inspections preclude retesting or re-inspection at the site of the Work.
  - 2. Materials and equipment which will require testing and inspection at the place of origin shall not be shipped prior to such testing and inspection.

**1.9 MANUFACTURERS' RECOMMENDATIONS**

- A. All equipment specified and used in the project shall be installed in accordance with the approved manufacturer's current written recommendations.
- B. All such equipment, material, etc., shall be of the manufacturer's latest system or line.

**1.10 SUBSTITUTIONS**

- A. Conditions: Contractor's substitutions shall be considered when one or more conditions are satisfied, as determined by the Engineer. (The Contractor's submittal and Engineer's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.)
  - 1. Extensive revisions to Contract Documents are not required.
  - 2. Proposed changes are in keeping with the general intent of the Contract Documents.
  - 3. Request is timely, fully documented and properly submitted.
  - 4. Request is directly related to an "or equal" clause or similar language in the Contract Documents.
  - 5. The specified product or method of construction cannot be provided within the Contract Time. The request shall not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
  - 6. The specified product or method of construction cannot receive necessary approval by governing authority, and the requested substitution can.

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7. Substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear.
  - a. Additional responsibilities for the Owner may include additional compensation to the Engineer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
  - b. Contractor shall provide all data in support of any proposed substitute or "or-equal" at Contractor's expense.
8. Specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
9. Specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.
10. Specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

*1.11 SUBSTITUTION REQUEST FORM*

- A. Use Substitution Request Form in on page 01 35 00-5.
- B. Submit one form (4 copies) for each request.

**END SECTION**

MATERIAL SUBSTITUTION PROCEDURES  
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### SUBSTITUTION REQUEST FORM

Page 1 of 2

**TO:** \_\_\_\_\_

**PROJECT:** \_\_\_\_\_

We hereby submit for your consideration the following product instead of the specified item for the above project:

SECTION:	PARAGRAPH:	SPECIFIED ITEM:
_____	_____	_____
_____		

Proposed Substitution: \_\_\_\_\_  
\_\_\_\_\_

- Attach: 1) Complete technical data, including laboratory tests, if applicable.
- 2) Complete information on changes to Drawings and/or Specifications which proposed substitution will require for its proper installation.

A. Does the substitution affect dimensions on Drawings?

\_\_\_\_\_

\_\_\_\_\_

B. Will the undersigned pay for changes to the project design, including engineering and detailing costs caused by the requested substitution?

\_\_\_\_\_

\_\_\_\_\_

C. What affect does substitution have on other trades?

\_\_\_\_\_

\_\_\_\_\_

D. Differences between proposed substitution and specified item?

\_\_\_\_\_

\_\_\_\_\_

E. Manufacturer's guarantees of the proposed and specified items are:

\_\_\_\_ Same      \_\_\_\_\_ Different (explain on attached sheet)

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### SUBSTITUTION REQUEST FORM

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The undersigned states that the function, appearance and quality are equivalent or superior to the specified item.

Submitted By:

Signature \_\_\_\_\_

Firm \_\_\_\_\_

Address \_\_\_\_\_

Date \_\_\_\_\_

Telephone \_\_\_\_\_

For Use by Design Consultant
Accepted
Accepted as Noted
Not Accepted
Received Late
By _____
_____
Date _____
Remarks _____

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**SECTION 01 42 13**  
**DEFINITIONS AND ABBREVIATIONS**

**PART 1 GENERAL**

*1.1 DEFINITIONS AND TERMS*

- A. Whenever in these Specifications, or in other Contract Documents, the following terms are used, the intent and meaning shall be interpreted as follows:
1. Board: Lower Tule River Irrigation District Board.
  2. Calendar Day: Every day shown on the calendar.
  3. Contractor: The word "Contractor" means the person, firm or corporation to whom the award is made. Subcontractors as such will not be recognized.
    - a. Where pronouns "he", "his", or "him" are used in reference to the Contractor, it shall be inferred to be inclusive of all genders.
  4. Contract Unit Price: The Contractor's original bid for a single unit of an item of work in the Proposal.
  5. Contract Time: The number of calendar days for completion of the Work, including authorized time extensions. In the event a calendar date is specified for Project completion in lieu of a number of calendar days, the Work shall be completed by that calendar date. The Contract Time shall be computed by excluding the first and including the last day; and if the last day be Sunday or a legal holiday, that shall be excluded.
  6. Engineer: Provost & Pritchard Consulting Group, 400 East Main Street, Suite 300, Visalia, California 93291-6337, (559) 636-1166.
  7. Equipment: (Construction) - All machinery and equipment, together with the necessary supplies for upkeep and maintenance, and also tools and apparatus necessary for the proper construction and acceptable completion of work. (Installed) - All material or articles used in equipping a facility as furnishings or apparatus to fulfill a functional design.
  8. Final Completion: Final completion of construction. The Work must be reliably fulfilling its intended function, and all punch-list items must be resolved.
  9. General Conditions: As specified in Section 00 72 00 – General Conditions.
  10. General Requirements: All specifications contained in Division 1.
  11. Notice: Any notice allowed or required to be given by the Owner may be given by the Engineer.
  12. Owner: Lower Tule River Irrigation District, a California Irrigation District.

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13. Person: Any individual, association, partnership, corporation, trust, joint venture or other legal entity.
14. Plans: The drawings, profiles, cross-sections, working drawings and supplemental drawings, or reproduction thereof, approved by the Engineer, which show the location, character, dimensions or details of the work.
15. Proposal: The offer of a Bidder when submitted on the Proposal form; properly signed and guaranteed.
16. Reference Documents: Bulletins, Rules, Methods of Analysis or Test, Codes, Standards, and Specifications of public or private agencies, Engineer Societies, or Industrial Associations. Reference shall be to the latest edition thereof, including Amendments, which are in effect and published at the time the Request for Bids is issued, unless a specific edition is identified, in which case reference shall be to such specific edition. Reference Documents are intended to amplify the descriptions of materials, equipment, and construction systems and are to be considered a part of the Contract Documents insofar as the various sections thereof are referred to hereinafter. Examples of Reference Documents are Federal Specifications, State Standard Specifications, and those of American Society of Testing Materials (ASTM), American National Standards Institute (ANSI), American Standards Associations (ASA), and American Concrete Institute (ACI).
17. Salvage: The protection storage, and/or removal of specified existing equipment, parts or materials during the work for retention and later use by the Owner.
18. Sanitary Sewer: Any conduit and appurtenances intended for the reception and transfer of sewage.
19. State: The State of California.
20. State Standard Plans: State of California, Business and Transportation Agency, Department of Transportation, Caltrans, Standard Plans, latest revision.
21. State Standard Specifications: Standard Specifications for the project are those entitled "Standard Specifications, State of California, Business and Transportation Agency, Department of Transportation", current version, hereinafter referred to as the State Standard Specifications. These Specifications are to be considered a part of the Contract Documents insofar as they are not superseded by other provisions contained in Divisions 0 through 48 of these Specifications.
22. Storm Sewer: Any conduit and appurtenances intended for the reception and transfer of storm water.
23. Street: Any public road, highway, parkway, freeway, alley, walk or right-of-way.

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24. Substantial Completion: The state of construction when the Work is capable of fulfilling its intended function. There may be punch-list items still outstanding at substantial completion.
25. Surety: Any individual, firm or corporation bound with and for the Contractor for the acceptable performance, execution and completion of the Work, and for the satisfaction of all obligations incurred.
26. Utility: Tracks, overhead or underground wires, pipelines, conduits, ducts or structures, sewers or storm drains owned, operated or maintained in or across a public right-of-way or private easement.
27. Water Main: Any conduit and appurtenances intended for the distribution of water.
28. Working Day: Any weekday (Monday through Friday), not a designated national holiday, during which weather allows the Contractor to work four or more hours consecutively, starting no later than 10:00 AM.

1.2 REFERENCED STANDARDS

- A. The standards referred to, except as modified, shall have full force and effect as though printed in this Specification, and shall be the latest edition or revision thereof in effect on the bid opening date, unless a particular edition or issue is indicated. Copies of these standards are not available from the Owner. The Engineer will furnish, upon request, information as to how copies may be obtained.

1.3 LIST OF ABBREVIATIONS

- A. Abbreviations and terms, or pronouns in place of them, shall be interpreted as follows:

AA	Aluminum Association
AABC	Associated Air Balance Council
AAMA	Architectural Aluminum Manufacturers Association
AASHTO	American Association of State Highway and Transportation Officials
ABMA	American Boiler Manufacturers Association
ACI	American Concrete Institute
ACPA	American Concrete Pipe Association
ADC	Air Diffusion Council
AEIC	Association of Edison Illuminating Companies
AFBMA	Antifriction Bearing Manufacturers Association
AGA	American Gas Association
AGMA	American Gear Manufacturers Association
AHA	American Hardboard Association
AI	Asphalt Institute
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
ANSI	American National Standards Institute
APA	American Plywood Association

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API	American Petroleum Institute
APWA	American Public Works Association
ARI	American Refrigeration Institute
ASA	(now U.S.A.S.I., USA Standards Institute) Association & its Standard Specifications
ASAHC	American Society of Architectural Hardware Consultants
ASCE	American Society of Civil Engineers
ASHRAE	American Society of Heating, Refrigerating, and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASSE	American Society of Sanitary Engineers
ASTM	American Society for Testing and Materials
AWG	American Wire Gage
AWI	Architectural Woodwork Institute
AWPA	American Wood-Preservers' Association
AWS	American Welding Society
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America (formerly SCPI)
CAL/OSHA	California Occupational Safety and Health Administration
CALTRANS	California Department of Transportation
CBC	California Building Code
CCR	California Codes of Regulations
CDA	Copper Development Association
CEC	California Electrical Code
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
CISPI	Cast Iron Soil Pipe Institute
CMAA	Crane Manufacturers Association of America
CMC	California Mechanical Code
CPC	California Plumbing Code
CRA	California Redwood Association
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standard (U.S. Department of Commerce)
DHI	Door and Hardware Institute
DIPRA	Ductile Iron Pipe Research Association
EI	Edison Electric Institute
EJCDC	Engineers' Joint Contract Documents Committee
EPA	Environmental Protection Agency
FED SPEC	Federal Specification
FCI	Fluid Controls Institute
FGMA	Flat Glass Marketing Association
FIA	Factory Insurance Association
FM	Factory Mutual
FSA	Fluid Sealing Association
FTI	Facing Tile Institute
HEI	Heat Exchange Institute
HMI	Hoist Manufacturers Institute
HPMA	Hardwood Plywood Manufacturers Association
HTI	Hand Tools Institute



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ICBO	International Conference of Building Officials
I-B-R	Institute of Boiler and Radiator Manufacturers
IEEE	Institute of Electrical and Electronics Engineers
IES	Illuminating Engineering Society
IFI	Industrial Fasteners Institute
IPCEA	Insulated Power Cable Engineers Association
ISA	Instrument Society of America
JIC	Joint International Conference (Hydraulic Institute)
MHI	Materials Handling Institute
MIL	Military Specification
MMA	Monorail Manufacturers Association
MSS	Manufacturers' Standardization Society
NAAMM	National Association of Architectural Metals Manufacturers
NACE	National Association of Corrosion Engineers.
MBBPVI	National Board of Boiler and Pressure Vessel Inspectors
NBHA	National Builders Hardware Association
NCSPA	National Corrugated Steel Pipe Association
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NEMI	National Elevator Manufacturing Industry
NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
NLA	National Lime Association
NPC	National Plumbing Code
NPT	National Pipe Thread
NRCA	National Roofing Contractors' Association
NRMCA	National Ready Mixed Concrete Association
NSC	National Safety Council
NSF	National Sanitation Foundation
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturers Association
OSHA	Occupational Safety and Health Administration
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDI	Plumbing and Drainage Institute
PFI	Pipe Fabrication Institute
PS	Product Standard
RTI	Resilient Tile Institute (formerly AVATI)
SAE	Society of Automotive Engineers
SCPRF	Structural Clay Products Research Foundation
SI	International Systems of Units (Metric)
SIGMA	Sealed Insulating Glass Manufacturers Association
SFPA	Southern Forest Products Association
SJI	Steel Joist Institute
SMA	Screen Manufacturers Association
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SPFA	Steel Plate Fabricators Association
SPI	Society of the Plastics Industry

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SPTA	Southern Pressure Treaters Association
SSI	Scaffolding and Shoring Institute
SSPC	Steel Structures Painting Council
SSPWC	Standard Specifications for Public Works Construction (Greenbook)
UL	Underwriters' Laboratories
UPC	Uniform Plumbing Code
USBR	U.S. Bureau of Reclamation
USGS	United States Geological Survey
WCLA	West Coast Lumbermen's Association (Standard Grading and Dressing Rule)
WCLIB	West Coast Lumber Inspection Bureau
WIC	Woodwork Institute of California
WRI	Wire Reinforcement Institute, Inc.
WWPA	Western Wood Products Association

**END SECTION**

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**SECTION 01 43 00**  
**QUALITY CONTROL AND TESTING**

**PART 1 GENERAL**

*1.1 NOTICE OF DEFECTS*

- A. Prompt notice of all defective Work of which Owner or Engineer has actual knowledge will be given to Contractor.
- B. All defective Work may be rejected, ordered to be corrected, or accepted, at the discretion of the Owner and Engineer.

*1.2 ACCESS TO WORK*

- A. Owner, Engineer, their consultants and other representatives and personnel of Owner, independent testing laboratories, and governmental agencies with jurisdictional interests shall have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. Contractor shall provide them proper and safe conditions for such access and advise them of Contractor's Site safety procedures and programs so that they may comply therewith.

*1.3 MATERIALS AND EQUIPMENT*

- A. Materials and equipment shall be subject to the requirements of Section 01 35 00 – Material Substitution Procedures.

*1.4 PROJECT SITE TESTING*

- A. Contractor shall give Engineer timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.
- B. Except for specified material suitability tests, all initial routine tests of materials shall be at the expense of the Owner and shall be performed by an independent certified laboratory designated by the Owner. Whenever a specified percent relative compaction test is required and the material or portion thereof so tested fails to meet or exceed the relative compaction specified, all subsequent retesting shall be performed at the expense of the Contractor.
- C. All material suitability tests shall be at the expense of the Contractor. Testing shall be by an independent certified laboratory approved by the Engineer.

*1.5 TEST STANDARDS*

- A. All sampling, specimen preparation, and testing of materials shall be in accordance with the standards of nationally recognized technical organizations.
- B. The physical characteristics of all materials not particularly specified shall conform to the latest standards published by the ASTM, where applicable.

QUALITY CONTROL AND TESTING  
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**1.6 UNCOVERING WORK**

- A. If any Work (or the work of others) that is to be inspected, tested, or approved is covered by Contractor without concurrence of Engineer, it must, if requested by Engineer, be uncovered for Engineer's observation and recovered at Contractor's expense.
- B. If Engineer considers it necessary or advisable that covered Work be re-observed by Engineer or inspected or tested by others, Contractor, at Engineer's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as Engineer may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment.
  - 1. If it is found that the uncovered Work is defective, Contractor shall promptly correct said defects, including all work involved in uncovering and recovering the work, at no cost to the Owner.
  - 2. If, the uncovered Work is not found to be defective, Contractor shall be allowed an increase in the Contract Price or an extension of the Contract Times, or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction.

**1.7 CORRECTION OR REMOVAL OF DEFECTIVE OR REJECTED WORK**

- A. Upon receipt of notice, Contractor shall correct all defective or rejected Work and replace it with Work that is not defective, at no cost to the Owner.

**1.8 ACCEPTANCE OF DEFECTIVE WORK**

- A. If, instead of requiring correction or removal and replacement of defective Work, Owner prefers to accept it, Owner may do so.
  - 1. If any such acceptance occurs, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and Owner shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted.
  - 2. Engineer shall determine the reasonableness of the diminished value of Work so accepted and Contractor shall pay all costs involved in making such determination.

**END SECTION**

QUALITY CONTROL AND TESTING  
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**SECTION 01 50 00**  
**TEMPORARY FACILITIES**

**PART 1 GENERAL**

*1.1 GENERAL*

- A. The Contractor shall provide all temporary facilities and utilities required for completion of the Work as well as safety precautions and programs. No attempt is made to set out in detail the Contractor's means or methods necessary to accomplish the tasks involved.

*1.2 TEMPORARY UTILITIES*

A. Water

1. The Contractor may make arrangements with the Owner to use municipal water where appropriate during construction. See Section 01 51 36 – Watering of these specifications for details.
2. Water used for human consumption shall be kept free from contamination and shall conform to the requirements of the State and local authorities for potable water.

B. Sanitary Facilities

1. The Contractor shall provide suitable and adequate sanitary conveniences for the use his staff at the site of the Work. Such conveniences shall include chemical toilets or water closets and shall be located at appropriate locations at the site of the Work. All sanitary conveniences shall conform to the regulations of the public authority having jurisdiction over such matters. At the completion of the Work, all such sanitary conveniences shall be removed, and the site left in a sanitary condition.
2. With respect to sanitation facilities, the Contractor shall cooperate with and follow directions of representatives of the Public Health Service and the State. State and County Public Health Service representatives shall have access to the Work, whether it is in preparation or progress, and the Contractor shall provide facilities for such access and inspection.

*1.3 TEMPORARY CONSTRUCTION FACILITIES*

- A. Construction hoists, shoring, and similar temporary facilities shall be of ample size and capacity to adequately support and move the loads to which they will be subjected. Railings, enclosures, safety devices, and controls required by law or for adequate protection of life and property shall be provided.
- B. Temporary supports shall be designed with an adequate safety factor to assure adequate load bearing capability. The Contractor shall submit design calculations

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prepared by a professional registered engineer for staging and shoring prior to application of loads.

- C. Barriers shall be placed at each end of all excavations and at such places as may be necessary along excavations to warn all pedestrian and vehicular traffic of such excavations from one hour before sunset each day to one hour after sunrise of the next day until such excavation is entirely refilled, compacted, and paved. All excavations shall be barricaded in such a manner as to prevent persons from falling, walking, or otherwise entering any excavation in any street, roadway, parking lot, treatment plant, or any other area, public or private.
- D. The Contractor shall adequately identify and guard all hazardous areas and conditions by visual warning devices and, where necessary, physical barriers. Such devices shall, as a minimum, conform to the requirements of Cal/OSHA.
- E. At such time or times any temporary construction facilities and utilities are no longer required for the work, the Contractor shall notify the Engineer of his intent and schedule for removal of the temporary facilities and utilities, and obtain the Engineer's approval before removing the same. As approved, the Contractor shall remove the temporary facilities and utilities from the site as his property and leave the site in such condition as specified, as directed by the Engineer, and/or as indicated on the Plans.

**1.4 ACCESS ROADS AND STAGING AREA**

- A. Adequate access shall be maintained to all storage areas and other areas to which frequent access is required. The Contractor shall limit the location of his storage of equipment and materials outside of the project site. The Contractor shall make his own arrangements for space that may be required and bear all associated costs. The Contractor shall provide any temporary storage required for the protection of equipment and materials as recommended by manufacturers of such materials.
- B. Storage and protection:
  - 1. Materials and equipment shall be stored in accordance with supplier's written instructions, with seals and labels intact and legible. Exposed metal surfaces of valves, fittings and similar materials shall be coated in accordance with manufacturer's recommendations to prevent corrosion.
  - 2. Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to assure materials and equipment are undamaged and are maintained under required conditions.

**END SECTION**

TEMPORARY FACILITIES  
01 50 00-2

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**SECTION 01 51 36**  
**WATERING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of furnishing, hauling, and applying water required for compaction of embankments, backfills, subgrade, and base course, and for landscaping, and other construction operation.

*1.2 RELATED WORK*

- A. Section 01 50 00 – Temporary Facilities
- B. Section 01 57 27 – Dust Control

*1.3 REFERENCES*

- A. State Standard Specifications Section 10-6, Watering

**PART 2 PRODUCTS**

*2.1 WATER*

- A. Free of debris, organic matter, and other objectionable substances.

**PART 3 EXECUTION**

*3.1 WATER TRUCK*

- A. At least 1,000-gallon capacity.
- B. Keep at least one water truck on site at all times, unless Engineer approves removal of the truck from the site before final completion.

*3.2 APPLICATION*

- A. Use pressure type distributors or a pipeline equipped with sprinkler system. Provide approved meter devices near points of discharge.
- B. Ensure a uniform application of water for optimum moisture content. Avoid excessive runoff and minimize water waste.
- C. The Contractor may water excavation areas before excavating. Drill full depth of excavation to make moisture determinations.
- D. If over watering occurs, de-water at no additional expense to the Owner.

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3.3 *SPECIAL CONTROLS*

The Contractor shall take all reasonable means to minimize inconvenience and injury to the public by dust, noise, diversion of storm water, or other agencies under his control.

A. Dust Control

1. As specified in Section 01 57 27, Dust Control

B. Water

1. The Contractor shall pay for and shall construct all facilities necessary to furnish water for his use during construction. The Contractor shall pay for all water used for the Contractor's operations prior to final acceptance. The Contractor may make arrangements with the Owner to use non-potable well water or treated effluent where appropriate during construction.
2. Water used for human consumption shall be kept free from contamination and shall conform to the requirements of the State and local authorities for potable water.
3. Full compensation for furnishing all labor, materials, tools and equipment and for doing all work involved in furnishing and applying water as required by the Contract Documents and Specifications, State Standard Specifications, shall be considered as included in the contract unit prices paid for other items of work and no additional allowance will be made therefore.

**END SECTION**

WATERING  
01 51 36-2



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**SECTION 01 55 26**  
**TRAFFIC CONTROL PLAN**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of preparation of a Traffic Control Plan to provide for safe movement of vehicular, bicycle and pedestrian traffic around construction operations. The Contractor shall be solely responsible for providing all protective measures necessary.
- B. In addition to the following requirements, Contractor's Traffic Control Plan shall incorporate all elements required by the governmental agency responsible for issuing encroachment permits onto the road at issue, if those requirements differ from or exceed those set forth herein.

*1.2 REFERENCES*

- A. Caltrans Standard Specifications, current edition (State Standard Specifications)
- B. Caltrans Standard Plans, and Revised Standard Plans (State Standard Plans)
- C. California Department of Transportation (Caltrans) Manual of Uniform Traffic Control Devices, Current Edition
- D. AASHTO Roadside Design Guide, Current Edition
- E. U.S. Department of Transportation, Federal Highway Administration, (USDOT): Design Guidance: Accommodating Bicycle and Pedestrian Travel: a Recommended Approach

*1.3 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. The Traffic Control Plan shall be submitted prior to or at the Pre-Construction Conference, to allow sufficient time for the Engineer and the Owner to review the plan prior to Notice to Proceed. Note: If a Traffic Control Plan is provided in the Plans, it shall be considered to be a guideline only. Contractor shall be responsible for development, submittal and implementation of the final Traffic Control Plan under this paragraph and Section 01 57 56.
- C. The Traffic Control Plan submitted by the Contractor shall include specific detour routes, planned street closures, temporary signage, and flag persons if necessary, and a description of how Contractor plans to provide safe vehicle passage, as well as plans for the protection of pedestrians and bicyclists through the construction zone, throughout the duration of the project. The plan may be staged as appropriate to the scope of the construction work.

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- D. Engineer shall review and comment on the Traffic Control Plan as any other submittal.
- E. The Traffic Control Authority, as defined in Section 01 57 56, which is the authority in charge of the subject roads, may also provide comments on the Traffic Control Plan within the same time period as allowed for submittal review.
- F. Once the Traffic Control Authority is satisfied with the Traffic Control Plan and any applicable fees have been paid by Contractor, the Traffic Control Authority will issue the relevant encroachment permit.

**1.4 REQUIRED PERMITS**

- A. Required Permits for this project include the following. Each has been applied for by Owner and/or Engineer, and permit conditions are included in attachments to these Specifications. The required permit fees for each are shown below. Contractor shall pay each required permit fee, and all associated inspection fees. Costs for permits and inspection fees shall be included in Contractor's compensation under Bid Item No. 7
  - 1. Tulare County Encroachment Permit
  - 2. Other Permits

**PART 2 PRODUCTS**

- A. All products specified on the Traffic Control Plan shall conform to the requirements of Section 01 57 56, Traffic Control.

**PART 3 EXECUTION**

**3.1 TRAFFIC CONTROL PLAN GUIDELINES**

- A. Traffic Control Plan (TCP) shall be drawn on 24" x 36" plan sheets, unless otherwise approved by the Engineer. TCPs may be submitted in AutoCAD .DWG format, in PDF format, or in hard copy.
- B. TCP must use legible lettering and clear, contrasting, symbols for viewing or printing.
- C. Use a legend to define all signs and symbols and designate them with California MUTCD-standard nomenclature.
- D. Indicate Contractor's name, address, and telephone number. Include name and telephone number of the 24-hour contact person representing the Contractor.
- E. Indicate north arrow and bar scale.
- F. Show all nearby streets with street names.

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- G. Show existing traffic signals and regulatory signs within the work area and affected construction zone.
- H. Show existing striping, pavement markings, painted crosswalks, and bike lanes within the work area and affected construction zone.
- I. Show existing curbs, gutters, sidewalks, driveways, and intersections in the construction work zone including areas affected by taper transition.
- J. Show dimensions for all existing striping and proposed traffic control area within the work area and affected construction zone.
- K. Show staging area and materials storage area, as appropriate.
- L. Indicate location of construction signs, barricades, and delineators.
- M. Label all taper lengths and widths, delineator spacing and sign spacing. Spacing of channelizing devices should not exceed 25 feet.
- N. Show existing and proposed temporary parking restriction zones and signs, as needed, within the work area.
- O. Road closures will require approval from the Engineer.
- P. Signs and barricades required to direct pedestrians through or around the construction work zone shall be shown on the TCP.

3.2 *MANDATORY GENERAL NOTES*

- A. All Traffic Control Plans shall include the following General Notes, as minimum conditions. Additional conditions may be added at the discretion of the Traffic Control Plan preparer.
- B. All traffic control devices shall conform to the latest edition of the California Manual on Uniform Traffic Control Devices (California MUTCD).
- C. The Engineer or his representative has the authority to initiate field changes to assure public safety.
- D. All traffic control devices shall be removed from view when not in use.
- E. Work hours shall be restricted to the period between 8:00 a.m. and 4:30 p.m., Monday through Friday, unless approved otherwise.
- F. Night work is not allowed.
- G. Trenches must be back filled or plated during non-working hours.
- H. Pedestrian controls shall be provided as shown on the plans.
- I. Temporary "NO PARKING" signs shall be posted 24 hours prior to commencing work.

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- J. Access to driveways shall be maintained at all times unless other arrangements are made.
- K. The Contractor shall replace within 72 hours, all traffic signal loop detectors damaged during construction.
- L. The Contractor shall replace within 24 hours, all striping removed or damaged by construction work. (Striping may be replaced temporarily with tape.)
- M. All Workers shall be equipped with Personal Protective Equipment in compliance with the most recent version of the CAL/OSHA requirements, but at a minimum shall include an orange vest (or a reflective vest at night). All flaggers shall also be equipped with a hard hat, C28 "Stop/Slow" paddle and shall be trained in the proper fundamentals of flagging traffic.
- N. Any work that disturbs normal traffic signal operations shall be coordinated with the Engineer, 48 hours prior to beginning construction. Contact Engineer's representative at (559) 636-1166.
- O. The Contractor shall maintain all traffic control devices 24 hours per day and 7 days per week.
- P. A minimum of one, twelve (12) foot travel lane in each direction shall be maintained for public traffic unless otherwise approved by the Engineer.
- Q. All night work will require written approval from the Engineer. Lane closures, road detours, road closures, and traffic signal modifications associated with overnight construction activities will require warning signs be placed at least one week in advance of starting construction.
- R. A solar powered flashing arrow board shall be required on all arterial street lane closures.

**END SECTION**

TRAFFIC CONTROL PLAN  
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**SECTION 01 57 13**  
**EROSION CONTROL**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of protecting from erosion all areas disturbed by new construction and construction operations, including areas disturbed by demolition, earthwork, and fence, piping and equipment installation.

*1.2 RELATED WORK*

- A. Section 01 57 23 – Storm Water Pollution Prevention Plan
- B. Section 01 57 27 – Dust Control under 5 ac.

*1.3 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. One-bale of proposed straw.

**PART 2 PRODUCTS**

*2.1 RICE STRAW*

- A. Sterile rice straw.

**PART 3 EXECUTION**

*3.1 PREPARATION*

- A. Loosen areas to be protected by raking or other approved method before application. Maintain grading and drainage patterns.

*3.2 PLACING STRAW*

- A. Exercise particular care to ensure application is made uniformly.
- B. The Contractor shall install and maintain protected areas as required by the Storm Water Pollution Prevention Plan.

*3.3 ACCEPTANCE*

- A. Application will be considered complete when all soil disturbing activities are completed and all unpaved disturbed areas have an even application of straw. No gaps (larger than 6 inches x 6 inches) will be permitted.

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**END SECTION**

**EROSION CONTROL**  
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**SECTION 01 57 23**  
**STORM WATER POLLUTION PREVENTION PLAN**

**PART 1 GENERAL**

*1.1 WORK INCLUDES*

- A. The Contractor shall apply for and obtain coverage under State of California Construction General Permit Order 2022-0057-DWQ, as applicable, at least three weeks before starting Work and shall implement storm water pollution prevention measures as prescribed in the Legally Responsible Person approved SWPPP to prevent sediment and/or pollutants from entering storm drains, streams, or water bodies throughout the duration of the Work in compliance with the permit requirements, including CalGreen Building Standards. Work shall be performed in accordance with all Federal, State, and local regulations. It is assumed that the project's total disturbed surface area is greater than 1 acre.
- B. The Contractor shall furnish and exercise every reasonable precaution to protect channels, storm drains, and bodies of water from pollution and provide all labor, materials, tools, and equipment necessary to prevent storm water pollution associated with construction activities, including preparation of Stormwater Pollution Prevention Plan (SWPPP) and amendments if necessary for CGP Compliance, installation, maintenance and final removal of all temporary and permanent erosion and sediment control measures, in accordance with the requirements of the Contract Documents.
1. The Legally Responsible Person (LRP) is Lower Tule River Irrigation District.
  2. The Approved Signatory for the LRP is Mr. Eric Limas.
- C. **Penalties:** Failure to comply with this Section may result in significant fines and possible imprisonment. The Regional Water Quality Control Board (RWQCB) or other prosecuting authority may assess fines for each violation. Should the District be fined or penalized as a result of the Contractor failing to comply with this Section and applicable permit requirements, the Contractor shall reimburse the District for any and all fines, penalties and related costs.
- D. All costs for work required for compliance with this Section shall be included in the price bid for SWPPP Preparation and Monitoring.

*1.2 REFERENCES*

- A. California State Water Resources Control Board, Construction General Permit 2022-0057-DWQ, [https://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2022/wqo\\_2022-0057-dwq.pdf](https://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2022/wqo_2022-0057-dwq.pdf)
- B. California Stormwater Quality Association (CASQA), <https://www.casqa.org/>

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1.3 SUBMITTALS

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Submittals under this section shall be completed and submitted at least three weeks prior to beginning work and within 2 days of issuance of the Notice to Proceed.
  - 1. In the event that CGP Waiver conditions apply, the contractor shall submit the Erosivity Value calculation, the corresponding project schedule, total disturbed area calculations, and an Under 1-Acre Pollution Prevention Plan (UPPP) demonstrating pollution prevention measures and steps to be taken to ensure no pollutant discharges from the project site to be submitted to the State Water Board via the SMARTS system. All documents shall be kept onsite in either a job trailer or accessible lockbox.
  - 2. In the event that a CGP Traditional or LUP SWPPP is required, or CGP Waiver conditions no longer apply, the contractor shall submit the appropriate project type SWPPP, Post-Construction Calculations, Dewatering Plan(s), Risk Level/Type Level Determination, additional Permit Registration Documents, Annual Reports, Sampling and Analysis reports, and all other permit compliance documents to be submitted to the State Water Board via the SMARTS system. All documents shall be kept onsite in either a job trailer or accessible lockbox.
- C. Certifications
  - 1. As applicable to the appropriate permit requirements:
    - a. Copy of the Certificate of Training issued by CASQA demonstrating qualification of the designated QSD or CBPELSG Licensed QSD Training Program proof of good standing.
    - b. Copy of the Certificate of Training issued by CASQA demonstrating qualification of the designated QSP(s) or CBPELSG Licensed QSD Training Program proof of good standing.
    - c. Copy of the Certificate of Training issued by the Project QSP demonstrating qualification of the designated QSP Delegate(s) Foundational and Site-Specific Training.
- D. Proof of project sign with SWPPP WDID number and the location to be displayed.
- E. Proof of installation of rain gauge on project site.
- F. Submit all required inspection reports including project photographs (weekly, quarterly, precipitation event (pre, during and post), quarterly, and sampling results) to QSD & LRP within 24 hours of inspection.
- G. Project Post-Construction Long-Term Maintenance Plan
- H. Project Post-Construction Stabilization Plan



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*1.4 QUALITY ASSURANCE*

At minimum, the following measures shall be taken to help ensure control of storm water and non-storm water pollution. These measures shall not be construed to limit or override the measures set forth and called for in the SWPPP.

- A. Develop, submit to the QSD, and obtain approval from the RWQCB for site dewatering. Control the rate and effect of dewatering in such a manner as to avoid all objectionable settlement and subsidence and to assure the integrity of the finished work.
- B. Where critical structures or facilities exist immediately adjacent to areas of proposed dewatering, establish reference points and observe at frequent intervals to detect any settlement that may develop. Conduct the dewatering operation in a manner that protects adjacent natural resources and facilities. Cost of repairing all damage to adjacent resources and facilities shall be the sole responsibility of the Contractor.
- C. Before commencing grading, excavation or filling in any part of the site, Contractor shall construct swales, diversion channels, inlet protection barriers, sedimentation traps, and other measures to guide runoff away from the work area and to capture eroded material before it reaches natural water courses. The measures shall be in accordance with the approved storm water pollution prevention plans.
- D. Arrange demolition activities to minimize erosion to the maximum practical extent. Clearing, excavation, and grading shall be limited to those areas of the Project site necessary for demolition. Minimize the area exposed and unprotected.
- E. Clearly mark and delineate the work limits activities. Equipment shall not be allowed to operate outside the limits of work or to disturb existing vegetation. Excavation and grading shall be completed during the dry season to the maximum extent possible.

*1.5 GENERAL REQUIREMENTS*

- A. The Contractor shall exercise care in preserving vegetation and protecting property, to avoid disturbing areas beyond the limits of the Work and promptly repair any damage caused by Contractor operations.
- B. The Contractor shall provide all necessary water pollution control devices to prevent, control, and abate water pollution, and implement good housekeeping pollution control measures to reduce the discharge of pollutants from the Site to the maximum extent practicable. These water pollution control devices include structural BMPs, drains, gutters, slope protection blankets and retention basins and shall be constructed concurrently with other Work at the earliest practicable time.
- C. Stockpiles of earth and other construction-related materials shall be protected from being transported from the Site by wind or water using covers or equivalent.
- D. The Contractor shall properly store and handle fuels, oils, solvents, and other toxic materials in a manner not to contaminate the soil or surface waters, enter the groundwater, or be placed where they may enter a live stream, channel, drain, or

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other water conveyance facilities. All approved toxic storage containers shall be protected from weather. Spills shall be cleaned immediately, and soiled materials shall be properly disposed of. Spills shall not be washed into live streams, channels, drains, storm drains, or other water conveyance facilities.

- E. Excess or waste concrete (including concrete decant water) shall not be washed onto bare ground, into the public way or any drainage systems. The concrete wastes shall be retained on-site until they can be appropriately disposed of or recycled. Concrete wastes shall not be washed into live streams, channels, drains, storm drains, other water conveyance facilities, bare ground or unapproved concrete washout containment areas.
- F. Non-stormwater runoff from equipment washing, vehicle washing, and any other activities shall be contained at the work site and properly disposed of. Non-stormwater runoff shall not be allowed to enter live streams, channels, drains, storm drains, or other water conveyance facilities.
- G. The Contractor shall prevent sediments and other materials to be tracked from the Site by vehicle traffic. Construction entrance roadways shall be stabilized to inhibit sediments from being deposited onto public ways. The Contractor shall immediately sweep up accidental depositions and not allow depositions to be washed away by rain or by any other means.

1.6 *REGULATORY REQUIREMENTS*

- A. The Contractor shall comply with the requirements of the State Water Resources Control Board (SWRCB), RWQCB, California Administrative Code, California Building Code, Owner and any other agencies having jurisdiction in storm water and non-storm water discharges and waste management.
- B. General Permit Registration Documents:
  - 1. The Contractor shall employ or contract with qualified personnel to prepare all compliance documents in accordance with the applicable regulatory requirements.
  - 2. All engineering calculations, reports, and drawings shall be prepared, and signed by a California licensed engineer in accordance with California Business and Professional Code Section 6700, et seq.
  - 3. The LRP's qualified personnel shall file the required documents, as necessary, through the SWRCB's Storm Water Multiple Application and Report Tracking System (SMARTS) website.
  - 4. The Contractor shall mail the appropriate application fee to the SWRCB no later than two (2) days after notification of submittal to the SWRCB via SMARTS. The Contractor shall affix the SWRCB Fee Statement Letter to the application fee. The Contractor shall pay all amendment and/or annual fees for subsequent years as required by the CGP.

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5. The Contractor shall not commence any construction work until a Waste Discharger Identification (WDID) number assigned by the SWRCB is received. The Contractor shall retain a copy of the WDID onsite, as evidence of the SWRCB acceptance of the PRDs/SWPPP/Waiver.
- C. The Contractor shall comply with the discharge and effluent prohibitions and limitations listing in the 2022 CGP.

1.7 STORM WATER POLLUTION PREVENTION PLAN IMPLEMENTATION

A. General Requirements:

1. Implementation of all BMPs shall be overseen by trained personnel employed or retained by the Contractor.
2. All required site monitoring and water testing, as necessary, shall be overseen by a QSP employed or retained by the Contractor.
3. All erosion and sediment control measures shall be implemented as specified in the SWPPP or UPPP.
4. A copy of the UPPP/Waiver Documents/SWPPP, including working details (fact sheets) for construction site BMPs and applicable amendments, shall be kept and maintained by the Contractor on the construction site and continuously updated in accordance with CGP requirements to reflect current site conditions throughout the duration of the project.

B. The Contractor shall implement all activities required by the CGP for the Type and/or Risk Level of the project as detailed in the SWPPP in accordance with the CGP. The SWPPP shall identify applicable best management practices (BMPs). All stormwater or non-stormwater pollution prevention activities specified in the SWPPP shall comply with the guidance provided in the "*Stormwater Best Management Practice Handbook, Construction*," August 2023 or more current edition, published by the California Stormwater Quality Association (CASQA).

1. The SWPPP shall detail the placement of physical BMPs required for installation and the methods used to comply with those BMPs. The Contractor's preferred techniques shall show how it will comply with the stated objectives of the SWPPP and the terms of the CGP.

C. Non-Stormwater Management: As specified in the CGP as appropriate to the project Risk Level, the SWPPP shall discuss any non-stormwater sources (i.e., landscaping, irrigation, pipe flushing, street washing and dewatering). In addition, the SWPPP shall include standard observation measures and BMPs, including BCT/BAT practices that are to be implemented in order to reduce the pollutant loading in the discharge waters.

D. Amendments: All SWPPP amendments shall be prepared by the QSD at no additional cost to the Owner.

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1. The Contractor shall, at no additional cost to the Owner, amend the SWPPP whenever there is a change in construction or operations which may affect the discharge of pollutants to stormwater. All fees as determined by the SWRCB will be paid by the Contractor.
  2. The Contractor shall, at no additional cost to the Owner, amend the SWPPP if it is in violation of any conditions of the CGP or has not achieved the general objective of reducing pollutants in stormwater discharges. All fees as determined by the SWRCB will be paid by the Contractor.
- E. Annual Reporting: The Contractor shall submit to the LRP an annual report and all required information for SMARTS data entry, no later than July 15<sup>th</sup> of each year. The LRP shall submit to the SWRCB via the SMARTS system in accordance with the requirements the CGP, including but not limited to: all inspection reports from the QSD and QSP/QSP delegate, training records/certifications from the QSD, QSP, and QSP delegate, a summary and evaluation of all sampling and analysis results, original laboratory reports, chain of custody forms, a summary of all corrective actions taken during the compliance year and identification of any compliance activities or corrective actions that were not implemented. The LRP will certify the annual report by September 1<sup>st</sup>. A project of 90 days or more duration can require more than one Annual Report. See below.
1. An Annual Report is required while the Project is still under construction, if construction begins not later than June 1 of a calendar year and is not completed by September 1 of that same year.
  2. An Annual Report is required, without exception, within 90 days of or prior to the September 1 following project completion.
- Example: A project commencing on May 31 and completed on September 2 of the same year would require an annual report both by September 1 of the reporting year, and prior Notice of Termination submittal.
- F. Notice of Termination: Once construction is completed and the Site has been stabilized with final, sustainable cover, the QSP shall prepare a Notice of Termination (NOT), including a final site map, photos, project post-construction long term maintenance plan, final QSP post-construction inspection, and a final project Annual Report, shall obtain necessary signatures from the LRP and shall submit all through the State Water Board's SMARTS website within 80 days after all land disturbing activities end and construction is complete. The LRP will certify the Notice of Termination within 90 days of all land disturbing activities end and construction is complete via SMARTS in accordance with the CGP.

A Notice of Termination is distinct from an Annual Report. Both are required.

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**PART 2 PRODUCTS**

2.1 *GENERAL*

- A. Materials furnished for BMPs shall meet the requirements of the California Stormwater Quality Association, *Stormwater Best Management Practice Handbook, Construction* – August 2023 edition (or most current version) unless otherwise indicated.
- B. Before the work begins, sufficient equipment shall be available on the site to assure that the operation and adequacy of the erosion control plans can be continuously maintained.
- C. If Fiber Rolls are to be used, sterile, hemp/burlap covered rolls are allowed. Plastic Mesh encased Fiber Rolls are not allowed.

**PART 3 EXECUTION**

3.1 *GENERAL DESCRIPTION*

- A. The Contractor shall install and maintain all pollution, erosion, and sediment control measures and carry out inspections in accordance the approved SWPPP/UPPP.
- B. Sediment transport and erosion from working stockpiles shall be controlled and restricted from moving beyond the immediately stockpile area by implementing applicable BMPs, including but not limited to construction of temporary toe-of-slope ditches and accompanying silt fences as necessary. If the BMPs proposed in the SWPPP prove inadequate to control sediment transport and erosion on the Site, the Contractor shall without delay implement additional provisions to obtain effective control. The SWPPP shall be updated to reflect the necessary changes as discussed in paragraph 1.7 above.
- C. The Contractor shall be responsible for taking the proper actions to prevent contaminants and sediments from leaving the project Site. The Contractor shall take immediate action if directed by the Construction Manager/LRP, or if the Contractor observes contaminants and/or sediments entering the storm drainage system, to prevent further stormwater from entering the system.

3.2 *NOTIFICATION AND REPORTING*

- A. If non-stormwater pollution occurs in the work area for any reason or when the Contractor becomes aware of any violation of this Section, the Contractor shall correct the problem and shall follow the requirements of the SWPPP for monitoring, control and reporting of non-stormwater discharges.

3.3 *FIELD QUALITY CONTROL*

- A. The Contractor shall maintain the BMPs and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures.

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Should the QSP note any deficiencies in necessary BMPs during the course of QSP's inspections and reporting, Contractor shall immediately repair or replace the defective BMPs as required by the QSP.

**3.4 INSPECTIONS**

- A. The Contractor's QSP shall inspect disturbed areas of the construction site, areas that have not been finally stabilized, areas used for storage of materials exposed to precipitation, stabilization practices, structural practices, other controls, and area where vehicles are stored and/or exit the Site at least weekly, and in accordance with CGP precipitation event inspection requirements. The QSP shall perform quarterly inspections per CGP requirements.
- B. The Contractor's QSP shall inspect discharge locations or points to ascertain whether BMPs are effective in preventing significant impacts to receiving waters. Inspect locations where vehicles exit the Site for evidence of offsite sediment tracking.
- C. If required by the Project's Risk Level, Contractor's QSP shall conduct necessary Precipitation Event Monitoring, Sampling, and Reporting as required under the CGP.
- D. Inspection Reports shall be in compliance with the requirements of the CGP for the specified Risk Level/LUP Type. Furnish the report to the Construction Manager, QSD, Engineer, and LRP within 24 hours of the inspection as a part of the Contractor's daily report or as a standalone report.
- E. The Contractor's trained personnel shall be responsible for site discharge sampling and reporting as required under the CGP. Sample analysis reporting shall be submitted to the LRP and QSD within 24 hours of receipt from the field sampler and/or the laboratory along with sampling locations (latitude/longitude) and other requirements listed in the SWPPP.
- F. A copy of the QSP's inspection report shall be maintained on Site.

**3.5 RECORDS**

- A. The Contractor shall retain records/copies of data used to complete the PRDs; the SWPPP and all attachments and amendments; compliance certifications; notifications of non-compliance; training; incidents such as spills or other releases, including photographs as available; sampling and analysis of discharges discovered through visual monitoring; all reports required by the CGP; BMP inspections and checklists, and maintenance and repair activities; and activity-based BMPs, such as good housekeeping, that have been implemented.
- B. After the work is complete and accepted by the Owner, submit to the Engineer and Owner all records/copies of documents required by the CGP, including, but not limited to, the records/copies of the documents noted above, and all documents uploaded to the SMARTS system.

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**3.6 MAINTENANCE OF TEMPORARY FACILITIES**

- A. Inspect erosion and sediment control structures daily, including site exit locations, and as specified in the SWPPP.
- B. Sediment shall be removed from behind run off control structures after each storm, or as directed by the Engineer, LRP, QSD or QSP.
- C. If areas are seeded, Contractor shall examine those areas during and after major storms to check that grass is becoming established.

**3.7 DISPOSAL OF SEDIMENT FROM STORM WATER POLLUTION CONTROL STRUCTURES**

- A. Sediment excavated from temporary sediment control structures shall be disposed on the site with general fill or with topsoil. Sediment shall be allowed to dry out as required before reuse. All trash shall be removed before reuse.
- B. Contractor shall place the sediment removed from traps and other structures where it will not enter a storm drain or water course and where it will not immediately reenter the basin.

**3.8 REMOVAL OF TEMPORARY STORM WATER POLLUTION CONTROL MEASURES**

- A. In accordance with SWPPP requirements, temporary control measures shall be removed once all drainage area ground disturbance is completed, permanent drainage works have been constructed and full stabilization is achieved. The contractor shall not breach any temporary control structures until the associated catchment area is complete unless approved by the Engineer.

**END SECTION**

STORM WATER POLLUTION PREVENTION PLAN  
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STORM WATER POLLUTION PREVENTION PLAN  
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**SECTION 01 57 27**  
**DUST CONTROL**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of implementing measures to prevent air pollution during construction activities, in accordance with Federal, State, and local regulations. It is assumed that the Project will have a total disturbed area less than 5 acres.

*1.2 RELATED WORK*

- A. Section 01 50 00 – Temporary Facilities
- B. Section 01 51 36 – Watering
- C. Division 2 – Existing Conditions
- D. Division 31 – Earthwork

*1.3 REFERENCES*

- A. San Joaquin Air Pollution Control District (SJVAPCD) Regulation VIII.

*1.4 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Submittals under this section shall be completed and submitted at least 48 hours prior to beginning work.
- C. Proof of submittal of San Joaquin Air Pollution Control District (SJVAPCD) Construction Notification Form.

*1.5 QUALITY ASSURANCE*

- A. Control the rate and effect of watering in such a manner as to avoid all objectionable settlement and subsidence as approved by the Engineer and to assure the integrity of the finished work.
- B. Clearly mark and delineate the work limits activities.

*1.6 REGULATORY REQUIREMENTS*

- A. Contractor shall comply with all provisions of the SJVAPCD regulations, as well as Federal and State regulations.

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**PART 2 PRODUCTS**

*2.1 EQUIPMENT*

- A. Before the work begins, sufficient equipment and resources shall be available on the site to assure that the operation and adequacy of the dust control measures can be continuously maintained.

*2.2 DUST CONTROL MEASURES*

- A. Water shall be available to the contractor for dust control as specified in section 01 50 00 – Temporary Facilities.

**PART 3 EXECUTION**

*3.1 GENERAL DESCRIPTION*

- A. Dust control measures shall include, but may not be limited to: Water application, physical barriers limiting site access, reduction of vehicle speed on site, utilization of gravel pads, and utilization of grizzlies. If physical barriers are utilized, the Engineer shall approve the location, size, and type. Physical barriers shall be removed upon project completion.
- B. Furnish, install, maintain, and operate necessary control measures and other equipment necessary to prevent dust. Temporary measures shall be to Contractor's own design and Contractor shall be solely responsible for risks related to the management of dust control during construction.

*3.2 DUST CONTROL*

- A. The Contractor shall take whatever steps, procedures, or means as are required to limit dust generated by his operations during the Work, including Saturdays, Sundays, and Holidays. Dust shall be controlled to the standards of the local governing agency or, in the absence of local standards, to the satisfaction of the Engineer. Dust control shall extend to any unpaved road which the Contractor or any of his subcontractors are using, to excavation or fill areas, to demolition operations, and to other activities. Control shall be by sprinkling, use of dust palliatives, modification of operations, or any other means acceptable to the local governing agency or, in the absence of same, the Engineer.
- B. If the dust control is not adequate in the opinion of the Engineer, this work may be done by others, and the cost shall be deducted from the total payment due the Contractor.

**END SECTION**

DUST CONTROL  
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**SECTION 01 57 50**  
**CONSTRUCTION STAKES, LINES, AND GRADES**

**PART 1 GENERAL**

*1.1 LINES AND GRADE*

- A. The Work shall be executed in accordance with the lines and grades indicated in the Contract Documents. Distances and measurements, except elevations and structural dimensions, shall be made on horizontal planes.

*1.2 CONSTRUCTION STAKING*

- A. Engineer or Engineer's representative will provide project control monuments as shown on the Plans (vertical and horizontal) at the Owner's expense. The Engineer will provide one set of grade control stakes
1. Structure corners and offsets
  2. Pipeline alignments
- B. All other construction staking necessary for the work shall be done by Contractor with compensation included in bid item(s), as deemed appropriate by the Contractor.
- C. The Contractor shall be responsible for preserving construction survey stakes, permanent survey monuments and benchmarks for the duration of their usefulness. If any construction survey stakes permanent survey monuments or benchmarks are lost or disturbed and need to be replaced, such replacement shall be made by the Engineer at the expense of the Contractor.
- D. The Contractor shall notify the Engineer at least three (3) working days before he will require survey services in connection with laying out of any portion of the Work. The Contractor at his own expense shall dig all holes necessary for line and grade stakes prior to requesting survey services that depend on such digging.

**END SECTION**

CONSTRUCTION STAKES, LINES, AND GRADES  
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CONSTRUCTION STAKES, LINES, AND GRADES  
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**SECTION 01 57 56**  
**TRAFFIC CONTROL**

**PART 1 GENERAL**

*1.1 INTENT*

- A. Contractor shall prepare and have approved a Traffic Control Plan as specified in Section 01 55 26, Traffic Control Plan. The approving agency for the Traffic Control Plan (the Traffic Control Authority, or TCA) is Tulare County RMA , at ((559) 624-7000.

*1.2 WORK INCLUDED*

- A. The work of this section consists of implementation of the Traffic Control Plan to provide for safe movement of vehicular, bicycle and pedestrian traffic around construction operations. The Contractor shall be solely responsible for implementing providing all protective measures necessary.
- B. All work shall conform with the provisions of Caltrans Standard Specifications, Section 12, "Temporary Traffic Control," and the California Manual of Uniform Traffic Control Devices, Part 6, and as more particularly specified below.
- C. The Contractor shall establish and maintain detours and conduct construction operations in such a manner as to minimize hazard, inconvenience and disruption to the public.
- D. The Contractor shall provide for protection of pedestrians and separation of pedestrians from construction operations at all times.
- E. The Contractor shall clean up the site each day after completing work and shall remove all traffic hazards. Daily traffic control measures shall continue until cleanup activities have been satisfactorily completed and the Contractor's equipment has been removed from the traveled way.
- F. The Contractor shall direct, divert and detour traffic through, around and adjacent to construction operations in accordance with the approved Traffic Control Plan.
- G. With the approval of the TCA, Contractor may revise the Traffic Control Plan as Contractor, Owner and/or Engineer determine necessary.

*1.3 REFERENCES*

- A. Caltrans Standard Specifications, current edition (State Standard Specifications)
- B. Caltrans Standard Plans, and Revised Standard Plans (State Standard Plans)
- C. California Department of Transportation (Caltrans) Manual of Uniform Traffic Control Devices, Current Edition

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- D. AASHTO Roadside Design Guide, Current Edition
- E. U.S. Department of Transportation, Federal Highway Administration, (USDOT): Design Guidance: Accommodating Bicycle and Pedestrian Travel: a Recommended Approach

**1.4 SUBMITTALS**

- A. As specified in Section 01 33 00 – Submittals.

**1.5 PERMITS REQUIRED**

- A. An encroachment permit is required for this work, to be issued by TCA. A draft permit along with conditions is included in the Appendix to these Specifications. The permit fee shown is \$154.00. This fee shall be paid by Contractor, and shall be included in the Traffic Control bid item. No separate payment will be made.

**PART 2 PRODUCTS**

**2.1 CONSTRUCTION SIGNS**

- A. Construction signs shall conform to the standards of the California Manual on Uniform Traffic Control Devices (California MUTCD), current edition and Section 12, "Temporary Traffic Control," of the State Standard Specifications.
- B. Temporary warning signs in construction areas shall have a black legend on an orange background. Color for other signs shall follow the standard for all highway signs.
- C. All signs used shall be reflectorized or illuminated.
- D. Covers for existing signs shall be constructed of plywood or metal. No holes shall be drilled into existing signs.

**2.2 OTHER TRAFFIC CONTROL DEVICES**

- A. In general, all, traffic control devices shall conform to the standards of the California MUTCD, current edition and Section 12, "Temporary Traffic Control," of the State Standard Specifications.
- B. Cones and Delineators:
  - 1. Cones shall consist of conical-shaped plastic devices which shall be 18 inches to 24 inches in height.
  - 2. Delineators shall consist of cylindrical plastic devices, which shall be 48 inches in height.
  - 3. Cones and delineators shall have flexible bases of suitable weight to ensure stability.

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4. Cones used during hours of darkness shall be internally illuminated or reflectorized meeting the requirements of the California MUTCD.
- C. Barricades
1. Barricades shall be Type I, Type II or Type III, as set forth in the California MUTCD.
  2. Barricades used during hours of darkness shall be reflectorized and equipped with flashers.
- D. Flaggers
1. Flaggers may be required to provide for public safety or the regulation of traffic, or by jurisdictional authorities; and if used, shall be properly equipped and certified.
- E. Signalized Traffic Control System
1. A signalized traffic control system must be installed to control two-direction alternating traffic at all times. Traffic control system shall be designed by a registered civil engineer and submitted to Caltrans for approval. The Contractor shall have workers onsite 24 hours per day and 7 days a week to monitor the traffic control setup continuously while lane closure maintained to ensure that traffic control system is working properly and correct any problems immediately.

**PART 3 EXECUTION**

**3.1 GENERAL**

- A. A minimum of 30 calendar days in advance, the Contractor shall implement a public outreach program to inform the community of disruption to traffic due to construction.

**3.2 DIVERTING TRAFFIC**

- A. Whenever construction operations obstruct the flow of vehicular traffic or present a hazard to vehicles operating in the vicinity of construction operations, the Contractor shall take appropriate action to warn, detour and otherwise protect approaching drivers and vehicles.
- B. Whenever construction operations obstruct the flow of pedestrian traffic or present a hazard to pedestrians, the Contractor shall take appropriate action to protect and separate pedestrians from the work area. Such action may include placement of barricades, warning signs, and/or provision of personnel as required to protect vehicles and pedestrians as conditions warrant.
- C. Keep traffic areas free of excavated material, construction equipment, pipe and other materials and equipment.

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- D. Conduct operations in a manner to avoid unnecessary interference with public and private roads and drives and provide and maintain temporary access for businesses and residences. Provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel. When access to private driveways must be temporarily denied due to construction operations, notify the property owner or responsible party of such closure not less than 24 hours in advance of closure. Give notification in writing and include the estimated duration of the closure.
- F. The minimum separation between the edge of travel lane and the work area shall be six feet. A temporary protective K-rail barrier shall be installed if there is less than six feet of clearance between the work area and edge of travel lane.
- H. Notify the fire department, police/sheriff department, highway patrol, ambulance service, local school district, and transit 14 days before closing roadway or portion thereof. Notify said departments or agencies when streets are again passable for vehicles. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish Contractor's night emergency telephone numbers to the police or sheriff's department.
- I. Pedestrian and bicycle access along sidewalks and streets shall be kept open and safe from construction activities and traffic lanes.

3.3 *TRAFFIC CONTROL DEVICES*

A. General

- 1. Traffic control devices shall be provided in sufficient quantities and types as required providing safe and adequate traffic control.
- 2. During hours of darkness, approved lights shall be included, in proper working order, to illuminate signs and hazards and alert approaching traffic.
- 3. Barricades shall be furnished and maintained along all open trenches in contact with traffic.
- 4. No work may begin on any day or at any time before traffic control devices have been placed.

B. Placement

- 1. All traffic control devices shall be placed in accordance with the California MUTCD and approved Traffic Control Plan.
- 2. Locations of devices shall be adjusted to suit the conditions and circumstances of each detour situation. In all cases, signs shall be placed to most effectively convey their messages to approaching traffic.

C. Maintenance of Devices

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1. The Contractor shall maintain all traffic control devices, at proper locations and in proper working order, during construction operations and whenever a hazard resulting from Contractor's operations exists.
  2. The Contractor shall adjust and revise traffic control devices, placement, etc., to suit changing conditions around construction operations.
- D. Removal of Devices
1. Traffic control devices shall remain in place to alert approaching traffic of upcoming hazards.
  2. After hazard has been removed, all traffic control devices shall be removed. Signs shall be removed, or their messages covered to the satisfaction of the Owner.

**3.4 NOTICE OF CHANGES**

- A. The Contractor shall notify the Owner in writing at least forty-eight (48) hours, excluding holidays and weekends, prior to instituting any lane closure or detour. The Contractor shall also notify the Owner in writing at least forty-eight (48) hours, excluding holidays and weekends, prior to opening lane closures or detours before moving to another excavation segment. At the end of each day's work, the Contractor shall inform the Owner of the status of all detours and/or lane or road closures.

**3.5 EMERGENCY VEHICLE ACCESS THROUGH DETOURS**

- A. During all detours and/or street closures the Contractor shall provide for movement of emergency vehicles through the work area whenever possible.

**3.6 ROADWAY USAGE BETWEEN OPERATIONS**

- A. Keep fire hydrants and water control valves free from obstruction and available for use.
- A. At all times when work is not actually in progress, Contractor shall make passable and shall open to traffic such portions of the project and temporary roadways or portions thereof as may be agreed upon between Contractor and Owner.
- B. The Contractor shall not be permitted to maintain any lane closure or road closure during non-working hours without first obtaining approval of the Owner.
- C. Restoration of Pavement
  1. During non-working hours the Contractor shall restore travel lanes to their original alignment and configuration by means of backfilling and temporary pavement or bridging where possible.
  2. The Contractor shall place "ROUGH ROAD" signs conforming to the California MUTCD at uneven temporary pavement or bridging.

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3.7 *PARKING RESTRICTIONS*

- A. General: The Contractor shall post approved "NO PARKING" signs at all locations necessary to establish work areas and detour traffic.
- B. Signs:
  - 1. Signs shall read: "NO PARKING - CONSTRUCTION TOW-AWAY ZONE." Show hours of parking restriction.
  - 2. Signs shall be placed at least 24 hours in advance of restriction.

3.8 *PLATING OVER TRENCHES AND EXCAVATIONS*

- A. General:
  - 1. Plating shall be placed across all trenches and excavations in accordance with requirements of the specifications.
- B. Design of Plating:
  - 1. Plating for vehicular traffic shall be of sufficient width to accommodate the required number of travel lanes.
  - 2. Plating shall be designed to support H-20 vehicular traffic.
  - 3. All plating shall be set flush with travel surface or a satisfactory transition from travel surface to top of plating shall be provided.
    - a. A satisfactory transition shall mean a change in elevation between the levels of not less than twelve (12) inches horizontal to one (1) inch vertical.
    - b. Transition may be accomplished by means of temporary pavement.

END SECTION

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**SECTION 01 77 00**  
**CONTRACT CLOSEOUT**

**PART 1 GENERAL**

*1.1 GENERAL*

- A. It is the intent of these Contract Documents that the Contractor shall deliver a complete and operable facility capable of performing its intended functions and ready for use.

*1.2 CLEANING*

- A. Throughout the period of construction the Contractor shall keep the Work site free and clean of all rubbish and debris, and shall promptly remove from the site, or from property adjacent to the site of the Work, all unused and rejected materials, surplus earth, concrete, plaster, and debris, excepting select material which may be required for refilling or grading.

*1.3 FINAL SITE CLEAN-UP*

- A. Upon completion of the Work, and prior to final acceptance, the Contractor shall remove from the vicinity of the Work all paint, surplus material, and equipment belonging to him or used under his direction during construction.
- B. The Contractor shall restore to original condition all property not designated for alteration by these Contract Documents.

*1.4 FINAL BUILDING CLEAN-UP*

- A. On all building projects and wherever else applicable, besides general broom cleaning, the following special cleaning shall be performed at completion of the Work:
1. Putty stains and paint shall be removed from glass; glass shall be washed and polished, inside and outside. Care shall be exercised so as not to scratch glass.
  2. Marks, stains, fingerprints, and other soil and dirt shall be removed from painted, decorated, or stained work.
  3. Waxed woodwork shall be cleaned and polished.
  4. Hardware shall be cleaned and polished of all traces; this shall include removal of stains, dust, dirt, paints, and blemishes.
  5. Spots, soil, paint, plaster, and concrete shall be removed from tile; tile work shall be washed afterwards.

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6. Fixtures and equipment shall be cleaned and stains, paint, dirt, and dust shall be removed.
7. Temporary floor protection shall be removed; floors shall be cleaned, waxed, and buffed.
8. Dust, cobwebs, and traces of insects and dirt shall be removed.

1.5 *WASTE DISPOSAL*

- A. The Contractor shall dispose of surplus materials, waste products, demolition materials, and debris. The Contractor shall transport and dispose of waste materials in accordance with applicable laws and regulations.

1.6 *PROJECT RECORD DOCUMENTS*

- A. The Contractor shall maintain at the site, available to the Owner and Engineer, one copy of the Contract Documents, Drawings, Shop Drawings, Change Orders, and other modifications in good order and annotated to show all changes made during construction. These Documents shall be delivered to the Engineer for the Owner upon completion of the Work.
- B. Record documents shall be reviewed during progress meetings to ascertain that all changes have been recorded.
- C. Store Record Documents separate from documents used for construction.

1.7 *TOUCH-UP AND REPAIR*

- A. The Contractor shall touch-up or repair finished surfaces on structures, equipment, fixtures, or installations that have been damaged prior to final acceptance. Surfaces on which such touch-up or repair cannot be successfully accomplished shall be completely refinished or in the case of hardware and similar small items, the item shall be replaced. Such items shall include, but not be limited to, the following:
  1. Road surfaces
  2. Exposed structure surfaces
  3. Exposed equipment surfaces
  4. Exposed piping surfaces

1.8 *EQUIPMENT START-UP*

- A. After all acceptance tests have been completed by the Contractor and Owner but prior to final acceptance, the Contractor shall recheck all equipment for proper alignment and adjustment, check oil levels, re-lubricate all bearings and wearing points, and in general assure that all equipment is in proper condition for continuous operation.

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*1.9 OPERATION AND MAINTENANCE (O&M) MANUALS*

- A. See Section 01 33 00 – Submittal Procedures.

*1.10 FINAL EQUIPMENT CHECK*

- A. After testing and before acceptance, all equipment shall be test run by the Owner for a minimum of 7 days to ensure proper operation. At the end of the test run each piece of machinery shall be lubricated and all components and couplings checked for proper alignment and adjustment.
- B. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's inspection.
- C. Provide submittals to the Owner required by other governing authorities.

*1.11 MANUFACTURER'S CERTIFICATES OF PROPER INSTALLATION*

1. The Contractor shall submit manufacturers' certificates of proper installation for all items of equipment.

**PART 2 PRODUCTS**

(Not Used)

**PART 3 EXECUTION**

(Not Used)

**END SECTION**

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CONTRACT CLOSEOUT  
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LOWER TULE RIVER IRRIGATION DISTRICT  
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**SECTION 02 41 00**  
**DEMOLITION**

**PART 1 GENERAL**

*1.1 DESCRIPTION*

- A. The work of this section consists of demolition and removal of pavements, miscellaneous debris, and signs.
- B. This work may also include milling of asphaltic concrete and all operations associated with crushing of Portland cement concrete for aggregate base.
- C. Definitions:
  - 1. Portland Cement Concrete: A mixture of Portland cement, fine aggregate, coarse aggregate, admixtures (if used) and water, proportioned and mixed. Also, included is rebar.
  - 2. Asphalt Concrete: A mixture of liquid asphalt and graded aggregate used as paving material for roadways and parking lots.

*1.2 WORK INCLUDED*

- A. Repair and restoration of areas damaged due to demolition work.
- B. Removal of demolished materials from site.
- C. Remove existing piping and other existing structures as shown on the Plans to be removed.
- D. Properly dispose of all removed materials.
- E. Dewatering as needed in order to complete the proposed demolition.

*1.3 RELATED WORK*

- A. Section 01 57 23 – Storm Water Pollution Prevention Plan
- B. Section 01 57 27 – Dust Control
- C. Section 03 33 00 – Cast In Place Concrete

*1.4 SEQUENCING*

- A. Sequence work to minimize interference with water treatment facilities operation. The water plant must remain in operation until the end of the agricultural processing season. Prior to that time, work will be limited to mobilization, limited demolition, and exploratory digging to the extent that the plant can remain in operation.

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1.5 *REGULATORY REQUIREMENTS*

- A. Obtain required permits from Tulare County.
- B. Dispose of removed materials in an approved disposal or salvage facility.

1.6 *REFERENCES*

- A. Section 17-2 – Clearing and Grubbing, State Standard Specifications
- B. Section 19 – Earthwork, State Standard Specifications

1.7 *SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures
- B. Demolition plan including sequence of operations. The plan shall specifically address methods of demolition, schedule, sequence of demolition, and procedures

1.8 *QUALITY ASSURANCE*

- A. General: Take all necessary precautions with regard to safety in carrying out the demolition and site work. Erect suitable barriers around open excavations and fulfill all appropriate requirements of CAL/OSHA. Comply with safety requirements for demolition, ANSI A10.6-90.

1.9 *PROJECT CONDITIONS*

- A. Underground utilities exist at this site. Contractor shall take all necessary precautions to protect said utilities. Notify Engineer of any deviation in utility location from that which is shown on the drawings.
- B. Keep dust to a minimum at removal site and on haul roads. Use sprinklers or water trucks as necessary or as directed by the Engineer.
- C. Ensure safety of persons in demolition area. Provide temporary barricades as required.
- D. Excavations may encounter groundwater and require dewatering depending on the time of year and amount of seasonal run-off. Loose sands exposed in excavation sidewalls may be unstable and require shoring or lying back in accordance with OSHA requirements. Flowing sands may also be encountered in excavations below groundwater levels.

1.10 *CLOSEOUT SUBMITTALS*

- A. As specified in Section 01 77 00 – Contract Closeout.
- B. Show all capped and abandoned utility terminations and location of remaining facilities on project Record Drawings.

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**PART 2 PRODUCTS**

*2.1 REPAIR AND RESTORATION MATERIALS*

- A. Concrete shall be as specified in Section 03 33 00 – Cast In Place Concrete.
- B. Backfill materials shall be as required by Section 19 – Earthwork, State Standard Specifications.
- C. Asphalt and concrete shall match existing materials and conditions.
- D. Asphalt and concrete shall be replaced in conformance with governing authority standards.

**PART 3 EXECUTION**

*3.1 INSPECTION*

- A. Prior to demolition, inspect the site conditions, verifying all governing dimensions, notes and specification. Notify the Engineer of any errors or omissions in the contract documents.
- B. Make such explorations and probes as are necessary to ascertain any required protection measures before proceeding with the demolition and removal work.

*3.2 PREPARATION*

- A. Protect existing, appurtenances, structures, which are not to be demolished.
- B. Prior to demolition work, all soil erosion control measures specified in Section 01 57 23 - Stormwater Pollution Prevention Plan (SWPPP) and inlet protection barriers shall be in place. Contractor shall provide appropriate measures to prohibit demolition debris and/or soil from entering any watercourse.
  - 1. Protect all buildings, structures, utilities, and vegetation to remain.

*3.3 DEMOLITION REQUIREMENTS*

- A. Conduct demolition to protect and minimize damage to structures and existing improvements.
- B. Conduct salvaging to protect and minimize damage to salvaged equipment.
- C. All work within a Caltrans right of way shall conform to Section 15 of the State Standard Specifications.
- D. Execute the work in a careful, orderly and safe manner, with the least possible disturbance to the public. Cease operations immediately if adjacent work appears to be endangered. Do not resume operations until corrective measures have been taken.

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E. Pavement and Slabs:

1. Remove completely all Portland cement concrete slabs-on-grade including, but not limited to, equipment pads, sidewalks, etc. If approved by the Engineer, the Contractor may crush Portland concrete for use as aggregate base.
2. Saw cut existing asphalt concrete pavements cleanly in straight continuous lines. Remove asphalt concrete pavement as shown on the drawings
  - a. Asphalt Concrete Milling Equipment: Milling machines shall be power operated, self-propelled machines capable of removing the desired thickness. They shall have sufficient power, traction and stability to accurately maintain depth of cut and slope.
3. Any material thus processed shall conform to the specifications for Section 32 11 23 – Aggregate Base
4. In areas that are demolished, but where no future roads or structures are shown, the exposed subgrade shall be scarified an additional 18 inches before placing backfill.

F. Concrete and Masonry Structures: Remove structure to a minimum of 3 feet below grade. Break remaining portions to permit drainage. Remove completely if under proposed structures or roadways.

G. Items to be Salvaged: Remove as directed by the Engineer. Remove carefully. All salvaged material remains the property of the Owner. Store where directed by the Engineer.

H. Abandoned Utilities: Remove above ground utilities and terminate as approved by the utility company and the Engineer. Remove necessary portions of underground utilities to within 24 inches of excavation or final grade. Plug abandoned pipes and conduits with concrete plugs. Plugs shall be 6 inches or 2 times the pipe diameter in length, whichever is greater.

1. Water lines shall be capped as close as possible to active mains.

3.4 ORDER OF WORK

A. Coordination will be required with the Owner for temporary shut-off of existing system for connection of new pipeline to existing system connection. Contractor shall submit plans to Owner for approval for shut-off duration at least 10 days prior to shut-off.

3.5 PRESERVATION

A. If indicated or required, preserve trees, plants, rock outcroppings, or other features designated to remain. Protect trees and plants from damage; fell trees in a manner which shall not injure standing trees, plants and improvements which are to be preserved.

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3.6 *RESTORATION*

A. All demolition areas, staging/stockpiling, and open excavations shall be filled in accordance with the Earthwork Sections. Fill all open excavations deeper than one foot to an elevation to match the surrounding topography.

1. New Construction Areas: As shown on drawings.

3.7 *DISPOSAL*

A. As specified in Section 01 50 00 – Temporary Facilities.

**END SECTION**

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**SECTION 03 11 00**  
**CONCRETE FORMWORK**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Work required under this section consists of furnishing all materials, supplies, equipment, tools, transportation, and facilities, and performing all labor and services incidental to furnishing and installing concrete formwork as described in this section of the Specifications, shown on the accompanying Plans, or reasonably implied therefrom. The work shall include, but is not necessarily limited to:
- B. Scope:
  - 1. Design of formwork, shoring and reshoring.
  - 2. Furnishing, erection, and removal of forms.
  - 3. Shoring, bracing, and anchorage of formwork.
  - 4. Openings for other work.

*1.2 RELATED SECTIONS*

- A. Section 03 15 00 – Concrete Accessories
- B. Section 03 20 00 – Concrete Reinforcing
- C. Section 03 30 00 – Cast-In-Place Concrete
- D. Section 03 39 00 – Concrete Curing

*1.3 REFERENCES*

- A. Industry Codes and Standards
  - 1. American Concrete Institute (ACI) Manual of Concrete Practice
    - ACI 117 Standard Tolerances for Concrete Construction and Materials and Commentary
    - ACI 301 Specifications for Structural Concrete for Buildings
    - ACI 318 Building Code Requirements for Structural Concrete
    - ACI 347 Guide to Formwork for Concrete
  - 2. Voluntary Product Standard
    - a. PS-1 – Construction and Industrial Plywood
- B. Western Wood Products Association (WWPA)

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- C. American Plywood Association Design and Construction Guide
- D. Government Regulations
  - 1. U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Regulations
    - a. OSHA 29 CFR Part 1926.701 Safety and Health Regulations for Construction
  - 2. Cal/OSHA Standards, Division of Industrial Safety, Construction Safety Orders, Article 29 Erection and Construction
    - a. Section 1717 Falsework and Vertical Shoring
- E. Air Quality Management District – Local AQMD
- F. Where reference is made to one of the above, the revision in effect at the time of bid opening shall apply.

1.4 *SUBMITTALS*

- A. As specified in Section 01 33 00 - Submittal Procedures.
- B. Provide concrete construction joints and expansion joints of the types and locations indicated. Submit for approval shop drawings showing proposed location and type of required construction for any joints not shown on the Drawings, and sequence of forming and concrete placing operations.
- C. Provide formwork, shoring and reshoring calculations for information only.

1.5 *DESIGN REQUIREMENTS*

- A. Design, engineer and construct formwork, shoring and bracing to conform to ACI 318 Section 26.11. Resultant concrete to conform to required shape, line and dimension. Design of formwork is Contractor's responsibility.
- B. The formwork shall be designed for the loads and lateral pressures outlined in Chapter 2 of ACI 347R, and lateral forces as specified by the CBC.
- C. Above grade forms for elevated slabs and for walls exceeding 4 ft. in height shall be designed by a professional Civil or Structural engineer registered in the State of California.
- D. Foundation concrete may be placed directly into neat excavations, provided foundation trench walls are sufficiently stable [subject to approval of DSA]. Otherwise, minimum formwork is mandatory to ensure clean excavations and properly formed surfaces immediately prior to and during placing of concrete.

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**1.6 COORDINATION**

- A. Coordinate this Section with other Sections of work that require attachment of components to formwork.
- B. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, Contractor shall adjust reinforcement positioning to accomplish required cover or otherwise request instructions from Architect before proceeding.

**1.7 QUALITY ASSURANCE**

- A. Requirements of Regulatory Agencies. The requirements of California Division of Occupational Safety and Health, Construction Safety Orders Section 1717 and OSHA Part 1926, Section 1926.701 apply to the Work of this Section, and the Contractor shall prepare and maintain at least one (1) copy of the required drawings at the site. Design of the structures shown on the Drawings does not include any allowance or consideration for imposed construction loads. Provide forms, shoring and falsework adequate for imposed live and dead loads, including equipment, height of concrete drop, concrete and foundation pressures, stresses, lateral stability, and other safety factors during construction.
- B. Standards and Tolerances. Employ formwork complying with ACI 347 Guide to Formwork for Concrete, except as exceeded by the requirements of regulatory agencies or as otherwise indicated or specified. Design and construct formwork to produce finished concrete conforming to tolerances given in ACI 117
  - 1. Form offset shall meet the requirements of Class C.

**PART 2 PRODUCTS**

**2.1 FORM COATING**

- A. Form coating compounds shall be biodegradable with a VOC level less than 50 grams/liter. Non-grain raising and non-staining resin or polymer type that will not leave residual matter on surface of concrete or adversely affect bonding to concrete of paint, plaster, mortar, protective coatings, waterproofing or other applied materials. Coatings containing mineral oils, paraffin, waxes, or other non-drying ingredients are not permitted. For concrete surfaces contacting potable stored water, use only coatings and form-release agents that are completely non-toxic.

**2.2 LUMBER**

- A. WWPA Structural Light Framing No. 1 or Structural Joists and Planks No. 1, or equal. Board forms, if used, shall be No. 2 Common or better, T&G or shiplap, S1S2E, or better.
- B. Plywood. APA - MDO (Medium Density Overlay) Plyform, Group 1, Exterior, PS-1, for exposed surfaces. APA - BB (No-overlay) Plyform, Class 1, Exterior, PS-1 for unexposed surfaces.

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**2.3 METAL FORM TIES**

- A. Provide commercially manufactured, prefabricated rod, snap-off, or threaded internal disconnecting type of tensile strength to resist all imposed loads. Use only ties that leave no metal within 1½-inch of concrete surfaces after removal. Employ snap-off type ties having integral washer spreaders of diameter to fully close tie holes in forms.

**PART 3 EXECUTIONS**

**3.1 FORM TYPES**

- A. Smooth Surface Concrete. Use specified plywood or metal forms, as approved, for interior and exterior exposed above-grade concrete and all formed concrete in contact with liquids, waterproofing and protective coatings.
- B. General Concrete. Use either plywood or board forms for concealed surfaces, or form as specified for smooth surface concrete.

**3.2 SHORING AND FALSE WORK**

- A. Distribute loads properly over base area on which shoring is erected, either concrete slabs or ground; if on ground, protect against undermining or settlement, particularly against wetting of soils.
- B. Alignment. Construct forms to produce in finished structure all lines, grades, and camber, as required.

**3.3 FORM CONSTRUCTION**

- A. Erect formwork, shoring and bracing to achieve design requirements in accordance with requirements of ACI 318 Section 26.11.
- B. Build forms to exact shapes, sizes, lines, and dimensions as required to obtain accurate alignment, location and grades, and level and plumb work in finished structures. Provide for openings, offsets, keyways, recesses, moldings, chamfers, blocking, joint screeds, bulkheads, anchorages, and other required features. Make forms easily removable without hammering or prying against concrete. Use approved metal spreaders to provide accurate spreading of forms. Construct forms so that no sagging, leakage, or displacement occurs during and after pouring of concrete.
- C. Provide bracing to ensure stability of formwork. Shore or strengthen formwork subject to overstressing by construction loads.
- D. Arrange and assemble formwork to permit dismantling and stripping. Do not damage concrete during stripping. Permit removal of remaining principal shoring. Conform to Title 8, Subchapter 4, Construction Safety Orders, CCR.
- E. Align joints and make watertight. Keep form joints to a minimum.

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- F. Obtain approval before framing openings in structural members that are not indicated on Drawings.
- G. Form Joints and Tie Holes. Seal joints between form panels with specified calking compound. Unless form tie spreaders fully seal tie holes in forms, seal around ties with specified materials and prevent leakage of concrete mortar.
- H. Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required, of sufficient strength and character to maintain formwork in place while placing concrete.
- I. Reuse. Clean and recondition form material before each reuse. Fill all holes, cracks and defects. Unsatisfactory material (in the opinion of the Construction Manager) shall be rejected and removed from the site.
- J. Provide  $\frac{3}{4}$ " inch chamfers at all exposed outside corners in the maximum lengths possible. Use mill run chamfer strips surfaced all sides. Provide rounded top edges of sidewalks, walkways, and where directed.

3.4 *ALLOWABLE VARIATIONS FOR FORMED SURFACES*

- A. Tolerances: Per ACI 117 requirements.
- B. Surface irregularities, ACI 347R Class A, gradual or abrupt irregularities of 1/8 inch for exposed to view concrete. Class B, 1/4 inch for plaster cement finish.

3.5 *APPLICATION - FORM RELEASE AGENT*

- A. Apply form release agent on formwork in accordance with manufacturer's recommendations.
- B. Apply prior to placement of reinforcing steel, anchoring devices and embedded items.
- C. Do not apply form release agent where concrete surfaces will receive special finishes or applied coverings that are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces coated prior to placement of concrete.

3.6 *EMBEDDED PARTS, OPENINGS AND HARDWARE*

- A. Provide formed openings where required for items to be embedded in or passing through concrete work. No openings or embedded items permitted in structural slabs within 18 inches of columns. Conform to ACI 318 Section 26.11.
- B. Locate and set in place items that will be cast directly into concrete.
- C. Coordinate work of other Sections in forming and placing openings, slots, reglets, recesses, chases, sleeves, bolts, anchors and other inserts, whether indicated on the structural drawings or not.
- D. Install accessories in accordance with manufacturer's instructions, straight, level and plumb. Ensure items are not disturbed during concrete placement.

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- E. Install electrical conduits per the direction of the electrical contractor as not to reduce the strength of the construction. Support embedded pipes and conduits independently from reinforcing steel in a manner to prevent metallic contact and thereby prevent electrolytic deterioration. Place embedded pipes and conduits as nearly as possible to the centerline of the concrete section. Submit all conduit, piping and other wall penetrations, reinforcements and anchor bolt sizing and locations to Owner's review and approval.
- F. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- G. Close temporary openings with tight fitting panels, flush with inside face of forms and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.7 *FIELD QUALITY*

- A. Inspection of Forms: Check forms prior to placement of any concrete for grade and alignment.
- B. Control during Concrete Placement: Check forms during concrete placement and to promptly seal all mortar leaks and to correct all form movement or misalignment.

3.8 *REMOVAL OF FORMS AND SHORING*

- A. Do not remove forms or shoring until concrete has attained sufficient strength to support its own weight and all imposed construction and permanent loads.
- B. Form Removal. Minimum times for removal after concrete placement are as follows:

Beam sides but not shoring	3 days
Column forms and wall forms	2 days
Forms for supported slabs but not shoring	14 days

- C. Shoring and Falsework Removal. Do not remove shoring and falsework until 21 days after concrete placement, or until concrete has attained at least 90 percent of the 28 day design compressive strength as demonstrated by control test cylinders, but in no event, not sooner than 14 days.
- D. All form materials, during stripping of forms below finish grade, shall be removed and deposited unless otherwise approved by the Engineer.
- E. Restriction. Do not impose construction, equipment, or permanent loads on columns, supported slabs, or supported beams until concrete has attained the 28-day design compressive strength.
- F. Concrete Curing During Removals. Refer to Section 03 39 00 of these Specifications.

**END SECTION**

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**SECTION 03 15 00**  
**CONCRETE ACCESSORIES**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Furnish all materials, supplies, and performing all labor to furnish and install concrete accessories as described in this section of the Specifications, shown on the Plans. The work shall include, but is not necessarily limited to
1. Polyvinyl chloride waterstop.
  2. Hydrophilic waterstop
  3. Bentonite strip waterstop
  4. Preformed synthetic sponge rubber expansion joint material.
  5. Preformed bituminous fiber expansion joint material.

*1.2 REFERENCES*

- A. American Society for Testing and Materials (ASTM):
1. D412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension
  2. D570 - Standard Test Method for Water Absorption of Plastics
  3. D624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
  4. D638 - Standard Test Method for Tensile Properties of Plastics
  5. D746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
  6. D747 - Standard Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam
  7. D792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
  8. D994 - Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type)
  9. D2240 - Standard Test Method for Rubber Property—Durometer Hardness

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- B. U. S. Army Corps of Engineers (USACE):
  - 1. CRD-C-572, Specification for Polyvinyl Chloride Waterstop.

1.3 *RELATED WORK*

- A. Section 03 30 00 – Cast in Place Concrete
- B. Section 07 92 00 – Caulking and Sealants

1.4 *SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Product Data:
  - 1. Waterstops and Preformed Expansion Joint Material: Sufficient information on each type of material for review to determine conformance of material to requirements specified.
- C. Provide material certificates, shop fabrication and placement drawings, and schedule.
- D. Samples: Provide samples of each product to be supplied under this section.
- E. Manufacturer's Installation Instructions: For all materials specified under this section
- F. Quality Control Submittals:
  - 1. Certificates of Compliance:
    - a. Written certificates that waterstops and Preformed Expansion Joint Material supplied meet or exceed physical property requirements of this section.

1.5 *QUALITY ASSURANCE*

- A. Mock-Ups:
  - 1. 1. Welding Demonstration:
    - a. Demonstrate ability to weld acceptable joints in polyvinyl chloride waterstop before installation of waterstop begins.
- B. Field Joints:
  - 1. Polyvinyl Chloride Waterstop Field Joints: Shall be free of misalignment, bubbles, inadequate bond, porosity, cracks, offsets and other defects which would reduce the potential resistance of the material to water pressure at any point. Replace defective joints, remove faulty material from the site.
- C. Inspections:

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1. Quality of welded joints will be subject to acceptance of the Engineer.
2. Polyvinyl Chloride Waterstop: The following defects that represent a partial list that will be grounds for rejection.
  - a. Any combination of offset or crack which will result in a net reduction in the cross section of the waterstop in excess of 1/16-inch or 15 percent of the material thickness, at any point, whichever is less.
  - b. Misalignment of the joint, which will result in misalignment of the waterstop in excess of 1/2-inch in 10 feet.
  - c. Porosity in the welded joint as evidenced by visual inspection.
  - d. Bubbles or inadequate bonding.

**PART 2 PRODUCTS**

**2.1 MANUFACTURED UNITS**

**A. Waterstops:**

1. Polyvinyl Chloride Waterstops:
  - a. One of the following or Engineer approved equivalent:
    - 1) Vinylex Corporation, Kwik-Tie.
    - 2) Greenstreak Plastic Products Company, Inc.
  - b. Type: Ribbed Waterstop. Unless otherwise specified, joints shall be constructed as follows:
    - 1) Construction Joints: ribbed type, width to be 6 inches unless otherwise specified or shown on the plans, without center bulb.
    - 2) Expansion Joints: ribbed type, width to be 6 inches unless otherwise specified or shown on the plans, with hollow center bulb.
  - c. Provide polyvinyl chloride waterstops complying with following requirements:

<b>Property</b>	<b>Test Method</b>	<b>Required Limits</b>
Water absorption	ASTM D570	0.15% max
Tear Resistance	ASTM D624	200 lb/in (35 kN/m) min.
Ultimate Elongation	ASTM D638	350% min.
Tensile Strength	ASTM D638	2000 psi (13.78 Mpa) min.
Low Temperature Brittleness	ASTM D746	No Failure @ -35° F (-37° C)
Stiffness in Flexure	ASTM D747	600 psi (4.13 Mpa) min.
Specific Gravity	ASTM D792	1.45 max.

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Hardness, Shore A	ASTM D2240	79 $\pm$ 3
Tensile Strength after accelerated extraction	CRD-C 572	1850 psi (11.03 Mpa) min.
Elongation after accelerated extraction	CRD-C572	300% min.
Effect of Alkalies after 7 days: Weight Change Hardness Change	CRD-C572	between -0.10% / +0.25% +/- 5 points

2. Hydrophilic waterstop

- a. One of the following or Engineer approved equivalent:
  - 1) W. R. Grace and Company, Adcor ES
  - 2) Greenstreak Plastic Products Company, Inc., Hydrotite
- b. Performance Requirements as follows:

**Chloroprene Rubber**

Property	Test Method	Required Limits
Tensile Strength	ASTM D412	1300 PSI min.
Ultimate Elongation	ASTM D412	400% min.
Hardness (Shore A)	ASTM D2240	50 +/- 5
Tear Resistance	ASTM D624	100 lb/inch min.

**Modified Chloroprene (Hydrophilic) Rubber**

Property	Test Method	Required Limits
Tensile Strength	ASTM D412	350 PSI min.
Ultimate Elongation	ASTM D412	600% min.
Hardness (Shore A)	ASTM D2240	52 +/- 5
Tear Resistance	ASTM D624	50 lb/inch
Expansion Ratio	Volumetric Change - Distilled Water @ 70° F	3 to 1 min.

3. Bentonite Strip Waterstop

- a. One of the following or Engineer approved equivalent:
  - 1) Cetco, Waterstop, RX.
  - 2) Green Streak, Swell Stop

B. Prefomed Expansion Joint Materials:

- 1. Prefomed Synthetic Sponge Rubber Expansion Joint Material:
  - a. Manufacturers: One of the following or Engineer approved equivalent:

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- 1) JD Russell Co, Reflex
- 2) W.R. Meadows, Sponge Rubber Expansion Joint
2. Preformed Bituminous Fiber Expansion Joint Material:
  - a. Conform to ASTM D994, preformed bituminous type, 1/2-inch thick
  - b. Manufacturers: One of the following or Engineer approved equivalent:
    - 1) JD Russell Co., Fiberflex
    - 2) W.R. Meadows, Fiber Expansion Joint

**2.2 ACCESSORIES**

- A. Adhesives and sealants:
  1. Provide as recommended by product supplier.

**PART 3 EXECUTION**

**3.1 INSTALLATION**

- A. Waterstops - General:
  1. Waterstops shall be stored so as to permit free circulation of air around the waterstop material and to prevent direct exposure to sunlight.
  2. Install waterstops in concrete joints where indicated on the Drawings.
  3. Carry waterstops in walls into lower slabs and join to waterstops in slabs with appropriate types of fittings.
  4. In Water bearing Structures: Provide all joints with waterstops, whether indicated on the Drawings or not.
  5. Provide waterstops that are continuous.
  6. Set waterstops accurately to position and line as indicated on the Drawings.
  7. Hold and securely fix edges in position at intervals of not more than 24-inches so that they do not move during placing of concrete.
  8. Position the waterstop so that the center axis of the waterstop shall be coincident with the centerline of the joint, unless detailed otherwise.
  9. Do not drive nails, screws, or other fasteners through waterstops in vicinity of construction joints.
  10. Secure waterstop against movement at not more than 24-inches on centers.

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11. Terminate waterstops 3-inches from top of finish surfaces of walls and slabs unless otherwise specified or indicated on the Drawings.
12. When any waterstop is installed in the concrete on one side of a joint, while the other half or portion of the waterstop remains exposed to the atmosphere for more than two days, suitable precautions shall be taken to shade and protect the exposed waterstop from direct rays of sunlight during the entire exposure and until the exposed portion is embedded in concrete.
13. Use specific type in applications as indicated on the Drawings.
14. No scrap or recycled material shall be used.

B. Polyvinyl Chloride Waterstops:

1. Install waterstops so that joints are watertight.
2. Weld joints such as unions, crosses, ells, and tees, with thermostatically controlled equipment recommended by waterstop manufacturer.
  - a. The material shall not be damaged by heat sealing.
  - b. Make joints by overlapping then simultaneously cut the ends of the sections to be spliced so they will form a smooth even joint.
  - c. The continuity of the waterstop ribs and tubular center axis shall be maintained.
  - d. The splices shall have a tensile strength of not less than 60 percent of the unspliced materials tensile strength.
3. Butt joints of the ends of two identical waterstop sections may be made while the material is in the forms.
4. All joints with waterstops involving more than two ends to be joined together, and all joints that involve an angle cut, alignment change, or the joining of two dissimilar waterstop sections shall be prefabricated prior to placement in the forms, providing not less than 24-inch long strips of waterstop material beyond the joint.
5. Vertical crosses and tees shall be prefabricated by the manufacturer. Horizontal crosses or tees may be field or factory welded.
6. Split type waterstop will not be permitted except where specifically indicated on the Plans.

C. Hydrophillic Waterstops

1. Apply adhesive recommended by the manufacturer for the given application.



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2. Cut coil ends square or at proper angle for mitered corners with a sharp blade to fit splices together without overlaps.
3. Splices and exposed cells shall be sealed using adhesives recommended by the manufacturer.
4. Provide minimum concrete cover per manufacturer's recommendations and in no instance less than 2 inches.
5. Surfaces shall be even, smooth, clean and dry.
6. Do not use when the head exceeds 150'

D. Bentonite Waterstops

1. Apply adhesive recommended by the manufacturer for the given application.
2. Maintain the minimum clear cover recommended by the manufacturer but in no instance less than 2 inches.
3. Butt splice by pressing ends together to ensure no separation or air pockets. Do not overlap the ends of the waterstops.
4. Remove release paper immediately prior to the second concrete pour.
5. Replace waterstop showing signs of premature swelling, discontinuity or debris contamination.

E. Preformed Expansion Joint Material:

1. Fasten expansion joint strips to concrete, masonry, or forms with adhesive. No nailing will be permitted, nor shall expansion joint strips be placed without fastening.
2. Install expansion joint filler in accordance with manufacturer's instructions.
3. Install joint filler ½ inch (13 mm) below the concrete surface.
4. Prior to sealing, slide expansion joint cap over the expansion joint.
5. Place concrete and screed to finish grade, allow adequate curing time before removing top of expansion joint cap. Pull cap free and discard.
6. Seal with joint sealant.

F. Joints:

1. Install construction and expansion joints as indicated on the Plans.

**END SECTION**

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**SECTION 03 15 20**  
**ANCHOR BOLTS AND POST-INSTALLED ANCHORS**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of furnishing and installing all materials and equipment and providing all labor necessary to complete the work shown on the drawings and/or listed below and all other work and miscellaneous items not specifically mentioned but reasonably inferred for a complete installation, including all accessories and appurtenances required for a completed system.
- B. Cast-in-Place anchor bolts, anchor bolts and threaded rod anchors for epoxy grouting.
- C. Expansion anchors to be installed in hardened concrete.

*1.2 RELATED WORK*

- A. Section 03 30 00 – Cast-in-Place Concrete
- B. Section 03 60 00 - Grout
- C. Section 05 50 00 – Fabricated Metal

*1.3 SUBMITTALS*

- A. As specified in Section 01300 – Submittal Procedures.

*1.4 GENERAL*

- A. Unless otherwise specified or indicated on the drawings, all anchor bolts shall be cast-in-place bolts, shall have a diameter of at least 3/4 inch, and shall be headed and shall include a square washer a minimum of 1/4 inch thick and 2 inches square.
- B. Expansion anchors and threaded rod anchors indicated or accepted in lieu of cast-in-place anchor bolts for equipment or structural framing shall have a diameter of at least 3/4 inch and shall be ICC Evaluation Service Report listed.
  - 1. Unless otherwise specified or indicated on the drawings, or approved by the Engineer, all other expansion anchors shall have a diameter of at least 1/2 inch.

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**PART 2 MATERIALS**

**2.1 MATERIALS**

- A. Nuts and washers for anchor bolts and expansion anchors shall be the same material as the bolts or anchors they are used with.

<b>Application</b>	<b>Reference</b>
A. Anchor Bolts and Nuts	
1. Carbon Steel	ASTM A307
2. Stainless Steel	IFI-104, Grade 304 or 316
3. Galvanized Steel	Carbon steel bolts and nuts; hot-dip galvanized, ASTM A153 and A385.
B. Threaded Rod Anchors and Nuts	
1. Carbon Steel	ASTM F1554, Grade 55 with ASTM A563 nuts
2. Stainless Steel	ASTM 593 with ASTM F594 nuts
3. Galvanized Steel	Carbon steel bolts and nuts; hot-dip galvanized, ASTM A153 and A385
C. Flat Washers	ANSI B18.22.1; of the same material as anchor bolts and nuts.
D. Expansion Anchors	
1. For Concrete	Fed Spec FF-S-325; wedge type, Group II, Type 4, Class 1 or 2; self-drilling type, Group III, Type 1; or nondrilling type, Group VIII, Type 1 or 2; Hilti Kwik Bolt TZ2 ICC ESR-4622, Simpson Strong-Bolt 2 ICC ESR 3037, or ICC approved equivalent.
E. Adhesive Anchors	Hilti HIT RE-500 V3 ICC ESR 3814, ITW Red Head A7+ICC ESR 3903 or ICC approved equivalent.

- A. Anchor bolts, threaded rod anchors, expansion bolts and adhesive anchors for buried service, splash zones, and immersion service shall be stainless steel. Anchor bolts, threaded rods and adhesive anchors for exterior use shall be hot dipped galvanized. Zinc coated expansion anchors shall not be used for buried, splash zone, immersion or exterior service.

**PART 3 EXECUTION**

**3.1 ANCHOR BOLTS**

- A. Anchor bolts shall be delivered in time to permit setting before the structural concrete is placed. Anchor bolts which are cast in place in concrete shall be provided with sufficient threads to permit a nut to be installed on the concrete side of the concrete form or supporting template.
- B. Anchor bolts and threaded rod anchors which are to be epoxy grouted shall be clean and free of coatings that would weaken the bond with epoxy.

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- C. Two nuts, a jam nut, and a washer shall be furnished for anchor bolts and threaded rod anchors indicated on the drawings to have locknuts; two nuts and a washer shall be furnished for all other anchor bolts.
- D. Anti-seize thread lubricant shall be liberally applied to projecting, threaded portions of stainless steel anchor bolts and threaded rod anchors immediately before final installation and tightening of the nuts.

**3.2 EXPANSION ANCHORS**

- A. Expansion anchors shall be installed in conformity with the manufacturer's instructions and ICC Evaluation Service Report recommendations for maximum holding power, but in no case shall the depth of hold be less than four (4) bolt-hole diameters. The minimum distance between the center of any expansion anchor and an edge or exterior corner of concrete shall be at least four and one half (4-1/2) times the diameter of the hole in which the anchor is installed. Unless otherwise indicated on the Plans, the minimum distance between the centers of the expansion anchors shall be at least eight (8) times the diameter of the hole in which the anchors are installed.
- B. Anti-seize thread lubricant shall be liberally applied to threaded stainless steel components immediately before assembly.

**3.3 ADHESIVE ANCHORS**

- A. Adhesive anchors shall be installed in conformity with the manufacturer's instructions and ICC Evaluation Service Report recommendations. Anchors must be installed in holes drilled using carbide-tipped drill bits or diamond core drill bits. Should diamond core drill bits be used, the manufacturer's roughening tool must be used in conjunction with the bit.

**END SECTION**

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ANCHOR BOLTS AND POST-INSTALLED ANCHORS  
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**SECTION 03 20 00**  
**CONCRETE REINFORCING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Work required under this section consists of furnishing all materials, supplies, equipment, tools, transportation, and facilities, and performing all labor and services incidental to furnishing and installing concrete reinforcing work as described in this section of the Specifications, shown on the accompanying Plans, or reasonably implied therefrom, except as hereinafter specifically excluded. The work shall include, but is not necessarily limited to:
1. Provide reinforcing work, complete as indicated, specified and required.
  2. Furnishing and placing bar and wire reinforcement for cast-in-place concrete.

*1.2 RELATED WORK*

- A. Section 03 11 00 – Concrete Formwork
- B. Section 03 30 00 – Cast-In-Place Concrete
- C. Section 03 39 00 – Concrete Curing

*1.3 REFERENCES*

- A. Industry Codes and Standards
1. American Society for Testing and Materials (ASTM)
    - a. A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
    - b. A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
    - c. ASTM A706 - Specification for Deformed and Plain Low-Alloy Steel Deformed Bars for Concrete Reinforcement.
  2. California Building Code (CBC)
  3. Concrete Reinforcing Steel Institute (CRSI)
    - a. Manual of Standard Practice (CRSI Manual)
  4. American Concrete Institute (ACI)
    - a. ACI 301 Specification for Structural Concrete

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- b. ACI 315 - Details and Detailing of Concrete Reinforcing.
- c. ACI 318 - Building Code Requirements for Structural Concrete and Commentary.

1.4 SUBMITTALS

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Provide material certificates, shop fabrication and placement drawings, and schedule for all reinforcing steel, imbedded items, form release and curing compounds.
  - 1. Shop Drawings. Submit shop drawings for reinforcing steel prepared in accordance with ACI Details and Detailing Reinforcing. Show layouts, bending diagrams, assembly diagrams, dimensioned types and locations of all bar laps and splices, and shapes, dimensions, and details of bar reinforcing and accessories. Include layout plans for bar supports and chairs, with typical details. Dimensions and quantities shown on the shop drawings are the responsibility of the Contractor and Owner's approval of shop drawings shall not constitute approval of dimensions and quantities thereon.

1.5 QUALITY ASSURANCE

- A. Code Requirements: Unless otherwise specified all work specified herein and as shown on the drawings shall conform to the applicable requirements of the California Building Code (CBC), and the State Standard Specifications.
- B. Standard: Reinforcing steel installations shall conform to the current specification requirements of the Concrete Reinforcing Steel Institute "Manual of Standard Practice" (herein referred to as the CRSI Manual) except as otherwise indicated or specified.
- C. Shop Quality Control:
  - 1. Provide Testing Laboratory with access to fabrication plant to facilitate inspection of reinforcement. Provide notification of commencement and duration of shop fabrication in sufficient time to allow inspection.
- D. Field Quality Control: All continuous inspections shall be performed by "Special Inspectors" qualified and approved by Governing Building Code Authority or inspector as otherwise qualified and approved by the Owner. Reports as required by Code shall be prepared and submitted to Owner, Building Department, Design Professional in Responsible Charge and Contractor.
  - 1. Inspection of Reinforcing. Provide 48-hour advance notice to permit inspection of in-place reinforcement prior to closing forms, and refer to applicable requirements of Section 03 30 00 of these Specifications.
  - 2. Concreting Operations. During concrete placing, assign construction personnel to inspect reinforcement and maintain bars in correct positions at each pour location.

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E. COORDINATION

1. Coordinate with placement of formwork, formed openings and other Work.

**PART 2 PRODUCTS**

2.1 *REINFORCING*

- A. Deformed bars conforming to ASTM A615, Type "S", in the grades as follows, and conforming to ACI 318 Chapter 20 and Section 26.6.

1. For No.4 and larger bars, use 60 ksi yield grade.
2. For ties and stirrups, and No. 3 and smaller bars, use 40 or 60 ksi yield grade.

2.2 *WELDED WIRE REINFORCEMENT*

- A. Conform to ASTM A1064 in flat sheets, uncoated finish. 6 x 6 - W4.0 x W4.0 unless otherwise noted on drawings.

2.3 *TIE WIRE*

- A. Annealed steel, 16-gage minimum.

2.4 *REINFORCING SUPPORT*

- A. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions.
- B. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: Plastic coated steel type; size and shape as required.
- C. Concrete Blocks: Approximately 3 inches dimension each side.

2.5 *COUPLER SPLICE DEVICES*

- A. Reinforcing bar coupler/splice devices which bear current ICC Evaluation Report Number, and which develop at least 125 percent of bar yield strength in tension may be used with Owner's approval in lieu of lapped bar-type splices. Submit for Owner's approval in each instance.

2.6 *DOWELS*

- A. Where and as designated on Drawings, provide reinforcing bar dowels in new work and for anchorage to existing concrete. For anchorage where shown or required to existing construction, use non-shrink epoxy type grout or deferred bolting devices as approved in each instance and conforming to "Product" Article requirements of this Specification.

2.7 *FABRICATION AND DELIVERY*

- A. Conform to CRSI Manual Chapters 6 and 7 except as otherwise indicated or specified and ACI 315 and 318. Bundle reinforcement and tag with suitable

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identification to facilitate sorting and placing, and transport and store at site so as not to damage material. Keep a sufficient supply of tested, approved, and proper reinforcement at site to avoid delays.

- B. Bending and Forming. Fabricate bars of indicated size and accurately form to shapes and lengths indicated and required by methods not injurious to materials. Do not heat reinforcement for bending. Bars with kinks or bends not scheduled will be rejected. Rebending of bars is prohibited.

**PART 3 EXECUTION**

**3.1 PLACING**

- A. General: Comply with CBC and CRSI's "Manual of Standard Practice" for placing reinforcement, except no reduction of concrete cover is allowable for bars at concrete surfaces exposed in liquid or water-containing structures.
- B. Cleaning. Before placing reinforcing, and again before concrete is placed, clean reinforcement of loose mill scale, oil, or other coating that might destroy or reduce bond. Do not allow form coatings, release agents, bond breaker, or curing compound to contact reinforcement.
- C. Concrete coverage over reinforcing bars shall be in accordance with ACI 318 Section 20.5.1.3 unless otherwise shown on the Drawings. Measure the coverage to the outer edge of ties, stirrups, bar spacers, hangers, and like items, and detail and fabricate the reinforcing accordingly.
  - 1. Where fire protective cover is specified exceeding the ACI and structural drawing specification, the fire protective cover shall apply.
- D. Do not displace or damage vapor barrier where vapor barrier is specified or indicated on drawings. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.
- E. Accommodate placement of formed openings.
- F. Securing in Place. Accurately place reinforcement and securely wire tie in precise position at all points where bars cross. Tie stirrups to bars at both top and bottom. Bend ends of binding wires inward, allowing no encroachment on the concrete cover; exercise special care at surfaces to remain exposed and unpainted. Support bars in accordance with CRSI Manual Chapter 3, Specifications for Placing Bar Supports, using approved chairs and supports.
- G. Splices. Provide wired contact lap splices unless otherwise indicated or approved. Provide lap lengths as indicated on the Drawings.
  - 1. Tie reinforcement splices and intersections per CBC and CRSI, Chapter 10-General Principles for Placing, Splicing and Tying Reinforcing Bars, unless otherwise shown on the Drawings.
- H. Welding. Welding of reinforcing bars may be permitted on case-by-case basis. All welding of reinforcing bars will be approved by the Engineers.

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- I. Additional Reinforcing. Provide additional reinforcing bars at sleeves and openings as indicated on the Drawings.
- J. 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 as shown or required to fit work. Provide laps of no less than one complete mesh unless otherwise detailed. Tie every other wire at laps. Welded wire reinforcement rolls are not acceptable.
- K. During placing of structural concrete slabs, provide a full-time reinforcing steel placer to repair and replace reinforcing to its proper location. Provide additional chairs of the proper size available to place under bars displaced during the concrete pouring operation.

**END SECTION**

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**SECTION 03 30 00**  
**CAST-IN-PLACE CONCRETE**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Work required under this section consists of furnishing all materials, supplies, equipment, tools, transportation, and facilities, and performing all labor and services incidental to furnishing and installing concrete work as described in this section of the Specifications, shown on the accompanying Plans, or reasonably implied therefrom, except as hereinafter specifically excluded. The work shall include, but is not necessarily limited to:
1. All concrete placement and finishing.
  2. Installation of all reglets, bolts, anchors, sleeves, etc., whether furnished under this section or by others.
  3. The furnishing of all items required to be or shown on the Plans as embedded in concrete, which are not specifically required under other sections.
  4. Setting headers and screeds for finishing and protecting concrete.
- B. Where prior inspection and test of materials are required, documentary evidence, in the form of test reports, shall be furnished prior to the time the material is incorporated into the work. All rejected material shall be promptly removed from the premises.

*1.2 RELATED WORK*

- A. Section 03 11 00 – Concrete Formwork
- B. Section 03 15 00 – Concrete Accessories
- C. Section 03 15 20 – Anchor Bolts and Post-Installed Anchors
- D. Section 03 20 00 – Concrete Reinforcing
- E. Section 03 39 00 – Concrete Curing
- F. Section 03 41 00 – Precast Concrete Structures
- G. Section 03 60 00 – Grout
- H. Section 05 50 00 – Fabricated Metal
- I. Section 09 90 00 – Painting

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1.3 *REFERENCES*

- A. American Concrete Institute (ACI)
- B. American Society for Testing and Materials (ASTM)
- C. State Standard Specifications
- D. California Building Code (CBC)

1.4 *DEFECTIVE WORK*

- A. Work considered to be defective may be ordered, by the Engineer, to be replaced in which case the Contractor shall remove and replace the defective work at his expense. Work considered to be defective shall include, but not be limited to, the following:
  - 1. Concrete incorrectly formed, or not conforming to details and dimensions on the Plans or with the intent of these documents or concrete the surfaces of which are out of plumb or level.
  - 2. Concrete in which defective or inadequate reinforcing steel has been placed.
  - 3. Concrete containing wood, cloth, or other foreign matter, rock pockets, voids, honeycombs, cracks or cold joints not scheduled or indicated on the Plans.
  - 4. Concrete below specified strength.

1.5 *SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Provide material certificates, mix designs including laboratory tests, shop fabrication and placement drawings, and schedule for all reinforcing steel, embedded items, form release and curing compounds.
- C. The Contractor shall provide a proposed concrete placement plan (to minimize the effects of cracking and differential settlement) to the Engineer, and gain approval of said plan, prior to ordering of reinforcing steel. As a minimum this plan shall contain the layout of horizontal and vertical construction joints, spaced no greater than 30 feet apart (unless specifically approved otherwise by the Engineer), and a pour schedule for the individual slab and wall pours. All construction joints shall be sized in conformance with the Typical Longitudinal Keys Detail and shall contain water stops as shown on the Construction Joint with Waterstop Detail.

**PART 2 PRODUCTS**

2.1 *CONCRETE*

- A. Concrete shall conform to Section 90 of the State Standard Specifications. Portland cement shall be Type II, Type II Modified, or Type V. Unless otherwise shown on

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the concrete note sheet or specified in other sections, all concrete shall conform to the following table:

Location	28-day Compressive Strength (psi)	Minimum Cement Content	Maximum W/C	Slump	Air Content
Structural concrete exposed to sewage, manure, or industrial waste	4,500	611	0.45	4 inches +/- 1 inch	4% +/- 1%
Structural concrete	4,000	570	0.50	4 inches +/- 1 inch	4% +/- 1%
Structural footings and interior slabs	3,500	517	0.55	4 inches +/- 1 inch	4% +/- 1%
Pavement, exterior slab, sidewalks, and drive approaches	2,500	-	0.55	4 inches +/- 1 inch	4% +/- 1%

- B. Concrete for canal liner shall conform to Section 90 of the State Standard Specifications. Unless otherwise shown or specified, all concrete shall contain not less than 564 pounds of Portland cement per cubic yard of concrete (6 sack) with a minimum 28-day compressive strength of 3000 psi.
  - 1. Portland cement shall be Type II,
  - 2. Concrete shall contain 4% ±1% entrained air.
  - 3. Water/cement ratio shall not exceed 0.50 (by weight).
  - 4. Slump at placement shall be 4 inches.
- C. Concrete used for thrust blocks shall contain not less than 517 pounds of Type II Portland Cement per cubic yard of concrete (5 1/2 sack) with a slump of 4 inches +/- 1 inch with a minimum compressive strength of 2,500 psi.
- D. Concrete used for pipe encasement shall contain not less than 517 pounds of Type II Portland Cement per cubic yard of concrete (5 1/2 sack) with a minimum compressive strength of 2,500 psi.
- E. Slurry cement backfill used in lieu of compacted soil shall contain not less than 188-pounds of Type II Portland Cement per cubic yard of concrete (2 sack) and shall comply with Section 19 of the State Standard Specifications.
- F. Concrete mixtures shall conform to the minimum requirements of the following exposure classes in accordance with ACI 318-19 section 19.3:

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1. Thrust blocks, foundations and other concrete exposed to soil – F0, S1, W1, C1

2.2 *AGGREGATE*

- A. Aggregate for normal weight concrete shall conform to ASTM C33. Aggregates shall be free of dirt, clay balls, roots, bark and other deleterious substances and shall be thoroughly washed before use.
- B. The combined aggregates for concrete shall conform to the grading limits for the one-inch, maximum size specified in Section 90-1.02C(4)(d) of the State Standard Specifications, Combined Aggregate Grading.

2.3 *WATER*

- A. Water shall be clean and free from injurious amounts of acids, alkalis, salts, oils, organic materials or other deleterious substances.

2.4 *FLYASH*

- A. Fly Ash: ASTM C618, Class F
  1. Type of fly ash shall be compatible with the type of cement and the intended use of the concrete.
- B. The weight of fly ash conforming to ASTM C618 shall not exceed 25 percent of the total cementitious material.

2.5 *ADMIXTURES*

- A. Air Entraining: ASTM C260
- B. Water Reducing: ASTM C494, Type A or D
- C. Accelerating: ASTM C494, Type C or E
  1. No admixture containing any chloride ions is acceptable.
- D. Retarding: ASTM C494, Type B or D

**PART 3 EXECUTION**

3.1 *REINFORCING STEEL*

- A. Reinforcing shall comply with Section 03 20 00 – Concrete Reinforcement.

3.2 *FORMS*

- A. Formwork shall conform with Section 03 11 00 Concrete Formwork.

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3.3 *PLACING*

- A. All concrete shall be placed before it has taken its initial set and shall be placed in horizontal layers and in such a manner as to avoid segregation. The concrete adjacent to the forms and joints shall be thoroughly consolidated per ACI 309.
  - 1. Pumping equipment shall be of suitable type, without Y-sections, and with adequate pumping capacity.
  - 2. Loss of slump in pumping shall not exceed 1<sup>1</sup>/<sub>2</sub> ".
  - 3. Concrete shall not be placed through reinforcing that may cause separation of aggregates.
- B. The concrete shall be deposited as nearly as possible in its final position. Drop chutes and elephant trunks shall be used on drops greater than 5 feet. Concrete shall be placed at such a rate that all concrete in the same lift will be deposited on plastic concrete. The concrete comprising each unit of work shall be placed in a continuous lift.
- C. The Contractor shall notify the Engineer 24 hours (1 working day) prior to concrete placement.
  - 1. The form work and reinforcing steel placement shall be approved by the Engineer prior to ordering concrete.
- D. Form Removal. Minimum times for removal after concrete placement shall conform to 03 11 00 Concrete Formwork.
- E. Construction Joints
  - 1. At ends of the first concrete pour, provide forms that positively locate any waterstop. Ensure the end forms of walls are removable without releasing the side forms. Provide seals around reinforcement and water stop to prevent mortar leaks.
  - 2. Overlap the hardened concrete of the first pour with forms for the second pour. Brace the ends of the forms against the hardened concrete to prevent joint offsets and mortar leakage. Align any exterior features required on the finished surface.

3.4 *CONCRETE JOINTS*

- A. General
  - 1. Provide joints:
    - a. As shown on the Drawings and as noted below in these Specifications.
    - b. As required for constructability
    - c. After favorable review of layout, sequence and concrete placement program.

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2. Provide minimum curing times before the second placement:
  - a. 2 days after the first concrete placement at the joint.
  - b. 10 days after each adjacent concrete placement, for infill pours or checkerboard placement pattern.

B. Control Joints:

1. Space typical control joints in slabs on grade or suspended slabs not exceeding 10 feet, or as shown on the Drawings. Control joints shall not be provided in water containment structures.
2. If cast-in with the concrete, positively locate the preformed joint filler and hold rigidly in place during concreting.
3. If saw-cut, use a wheeled power saw as soon as the concrete surface is firm enough. Saw-cut control joints must be constructed within 8-hours after concrete placement. Fill the groove with sealant over a backer rod.

C. Construction Joints:

1. Produce quality concrete, with full continuity of reinforcing and water tightness across the joints.
2. Space typical slab joints not exceeding 30 feet in the direction of the transverse or secondary reinforcing, typically the smaller reinforcing nearer to the center of the slab thickness. Space typical vertical wall joints no more than 30 feet apart.
3. Provide all joints in walls and slabs, retaining liquids, or earth with 6-inch waterstops. Continue all reinforcing through the joint unless otherwise noted.
4. After the first concrete placement at the joint, do not walk on or disturb any reinforcing extending into the second placement area for at least 48 hours.
5. Before depositing new concrete on or against concrete that has hardened, clean and roughen the entire surface of the joint exposing clean coarse aggregate solidly embedded in mortar matrix. Provide typically 1/4-inch roughness or amplitude of the concrete surface measured from the top of the exposed aggregate to the bottom of pockets between stones.
6. Drench the prepared joint with clean water and remove prior to the concrete pour.
7. Use special care in vibrating adjacent to construction joints to ensure thorough consolidation of the concrete around the waterstops and against the hardened portion of the joint. Additional hand tamping may be required.
8. For joints that are shown on architectural drawings as having a continuous reveal or recess, leave the wood form or pour strip used to create the reveal or recess in place or re-insert before roughening. Prevent the next concrete placement from filling the reveal or recess.

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D. Expansion Joints

1. Stop all steel reinforcing clear of the joint at each side.
2. Provide center bulb waterstop continuously around the joint in walls and slabs retaining liquids.
3. Prepare a smooth first concrete surface with all voids filled.
4. Provide preformed joint filler, securely fastened to the existing concrete as directed by the Manufacturer.
5. Install bond breaker and sealant after curing is completed and when directed.

E. Bonding to Pre-existing Concrete: Mechanically roughen the old surface to a 1/4-inch amplitude, as defined in construction joint paragraph above. Apply epoxy bonding material prior to concreting, as recommended by the manufacturer.

F. Waterstop

1. Restrict field splices to butt joints in straight runs. For PVC type, make by heat welding, using a splicing iron. For rubber, provide sleeve joints and glue. Follow the manufacturer's specifications.
2. Positively locate and support in the forms so that concrete may be placed, consolidated, and vibrated on both sides of the embedded portion without displacement of the waterstop and without causing voids in the concrete. Protect the outstanding portion from damage during the first concrete pour and clean and positively support prior to the second pour. Place, consolidate and vibrate the second pour without displacement of the waterstop and without causing voids in the concrete.

3.5 CONCRETE CURING

A. Exposed concrete surfaces shall be protected from premature drying in accordance with Section 03 39 00 Concrete Curing.

3.6 FINISHING

A. Defective and honeycombed surfaces shall be chipped back to such a depth to expose solid concrete. The surface shall be dampened and coated with a bonding agent and packed with mortar.

B. Concrete Finishes for Vertical Wall Surfaces:

1. Form facing material shall produce a smooth, hard, uniform texture.
  - a. Use forms specified for surfaces exposed to view in accordance with the Plans and other Specification Sections.
2. At a minimum, repair the following surface defects:
  - a. Tie holes

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- b. Honeycombs deeper than  $\frac{1}{4}$ "
    - c. Air pockets deeper than  $\frac{1}{4}$ "
    - d. Rock holes deeper than  $\frac{1}{4}$ "
    - e. Scabbing
  3. Chip or rub off fins exceeding  $\frac{1}{8}$ " in height.
  4. Provide SF/ESF-3.0 finish and a smooth-rubbed finish for:
    - a. Walls being waterproofed, painted, coated with some other material.
    - b. Use at all exposed surfaces not specified to receive another finish.
- C. Related Uniform Surfaces (Except Slabs):
  1. Strike smooth tops of walls or buttresses, horizontal offsets, and similar unformed surfaces occurring adjacent to formed surfaces after concrete is placed.
  2. Float surface to a texture consistent with that of formed surfaces.
  3. Continue treatment uniformly across unformed surfaces.
- D. Concrete Finishes for Horizontal Slab Surfaces:
  1. General: Tamp concrete to force coarse aggregate down from surface. Scream with straightedge, eliminate high and low places, bring surface to required finish elevations; slope uniformly to drains. Dusting of surface with dry cement or sand during finishing processes not permitted.
  2. Slab Finish shall be as follows:
    - a. Surfaces intended to receive damp proofing or water proofing membranes: Float finish.
    - b. Floors intended to receive floor coverings and interior rooms: Trowel finish.
    - c. Sidewalks, garage floors, drive-throughs and ramps: Broom finish.
    - d. Exterior slabs, platforms, steps and landings, exterior and interior pedestrian ramps and interior stairs and all process equipment areas, not covered by other finish materials: Broom finish.
  3. Tolerance for finished surface shall not exceed  $SO F_F=35$ ,  $SO F_L = 25$ .
  4. No tolerance will be allowed that will result in the maximum running, or cross, slope exceeding the requirements of the Americans with Disabilities Act.

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**3.7 TESTING**

- A. Testing of concrete shall be as required by the Engineer and in accordance with ACI 301, Chapter 1.7.
  - 1. All costs of initial testing will be paid by the Owner unless otherwise noted.
  - 2. All costs involved, including those required by the Engineer, in retesting of concrete required because of a failure to meet these Specifications shall be at the expense of the Contractor.

**3.8 WATERTIGHTNESS OF CONCRETE WORK**

- A. It is the intent of this Specification to obtain concrete and grout with homogenous structure, which when hardened will have the required strength, is watertight, and resistance to weathering.

**3.9 HYDRAULIC TESTING OF STRUCTURES**

- A. It is the intent of this Specification to obtain concrete and grout with homogenous structure, which when hardened will have the required strength, watertightness, and resistance to weathering. Testing of structures shall be done in accordance with Section 03 05 10 Leakage Testing of Hydraulic Structures.

**END SECTION**

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**SECTION 03 39 00**  
**CONCRETE CURING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Work required under this section consists of furnishing all materials, supplies, equipment, tools, transportation, and facilities, and performing all labor and services incidental to concrete curing.

*1.2 RELATED WORK*

- A. Division 3 – Concrete

*1.3 REFERENCES*

- A. State Standard Specifications, latest edition with amendments.

*1.4 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.

**PART 2 PRODUCTS**

*2.1 METHODS OF CURING*

- A. Newly placed concrete shall be cured by the methods specified in Section 90-1.03B of the State Standard Specifications (SSS).
  - 1. 90-1.03B(2), Water Method
  - 2. 90-1.03B(3), Curing Compound Method
  - 3. 90-1.03B(4), Waterproof Membrane Method
  - 4. 90-1.03B(5), Forms-In-Place Method

**PART 3 EXECUTION**

*3.1 CURING*

- A. Exposed concrete surfaces shall be protected from premature drying by covering as soon as possible with canvas, plastic sheets with sealed joints, burlap, sand or other satisfactory materials and kept continuously moist; or, if the surfaces are not covered, they shall be kept continuously moist by flushing or sprinkling. Curing shall continue for a period of not less than 7 days after placing the concrete.

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- B. If curing compound is used, it must be nontoxic and taste and odor free, and provide a paintable concrete surface. Curing compound shall include a dye and two (2) applications shall be made to insure coverage. Curing materials and methods require approval by the Engineer prior to use.

**3.2 CURING STRUCTURES**

- A. Newly placed concrete for cast-in-place structures, other than highway bridge decks, shall be cured by the water method, the forms-in-place method, or, as permitted herein, by the curing compound method, in conformance with the provisions in SSS Section 90-1.03B, "Curing Concrete."
- B. The curing compound method using a pigmented curing compound may be used on concrete surfaces of construction joints, surfaces that are to be buried underground, and surfaces where only Ordinary Surface Finish is to be applied and on which a uniform color is not required and that will not be visible from a public traveled way. If the Contractor elects to use the curing compound method on the bottom slab of box girder spans, the curing compound shall be curing compound (1), pigmented, Type 2, Class B.
- C. The top surface of highway bridge decks shall be cured by both the curing compound method and the water method. The curing compound shall be curing compound (1), pigmented, Type 2, Class B.
- D. Concrete surfaces of minor structures, as defined in SSS Section 51-7, "Minor Structures," shall be cured by the water method, the forms-in-place method or the curing compound method.
- E. When deemed necessary by the Engineer during periods of hot weather, water shall be applied to concrete surfaces being cured by the curing compound method or by the forms-in-place method, until the Engineer determines that a cooling effect is no longer required. Application of water for this purpose will be paid for as extra work as provided in SSS Section 00 63 44 – Changes to the Work.

**3.3 CURING PRECAST CONCRETE MEMBERS**

- A. Precast concrete members shall be cured in conformance with any of the methods specified in SSS Section 90-1.03B, "Curing Concrete." Curing shall be provided for the minimum time specified for each method or until the concrete reaches its design strength, whichever is less. Steam curing may also be used for precast members and shall conform to the following provisions:
  - 1. After placement of the concrete, members shall be held for a minimum 4-hour pre-steaming period. If the ambient air temperature is below 50°F (10°C), steam shall be applied during the pre-steaming period to hold the air surrounding the member at a temperature between 50°F and 90 F (10°C and 32°C).
  - 2. To prevent moisture loss on exposed surfaces during the pre-steaming period, members shall be covered as soon as possible after casting or the exposed surfaces shall be kept wet by fog spray or wet blankets.

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3. Enclosures for steam curing shall allow free circulation of steam about the member and shall be constructed to contain the live steam with a minimum moisture loss. The use of tarpaulins or similar flexible covers will be permitted, provided they are kept in good repair and secured in such a manner as to prevent the loss of steam and moisture.
4. Steam at the jets shall be at low pressure and in a saturated condition. Steam jets shall not impinge directly on the concrete, test cylinders, or forms. During application of the steam, the temperature rise within the enclosure shall not exceed 40°F (22°C) per hour. The curing temperature throughout the enclosure shall not exceed 150 F (65°C) and shall be maintained at a constant level for a sufficient time necessary to develop the required transfer strength. Control cylinders shall be covered to prevent moisture loss and shall be placed in a location where temperature is representative of the average temperature of the enclosure.
5. Temperature recording devices that will provide an accurate, continuous, permanent record of the curing temperature shall be provided. A minimum of one temperature recording device per 200 feet of continuous bed length will be required for checking temperature.
6. Members in pretension beds shall be de-tensioned immediately after the termination of steam curing while the concrete and forms are still warm, or the temperature under the enclosure shall be maintained above 60 F (15°C) until the stress is transferred to the concrete.
7. Curing of precast concrete will be considered completed after termination of the steam curing cycle.

**3.4 CURING MISCELLANEOUS CONCRETE WORK**

- A. Exposed surfaces of curbs shall be cured by pigmented curing compounds as specified in SSS Section 90-1.03B(3), "Curing Compound Method."
- B. Concrete sidewalks, gutter depressions, island paving, curb ramps, driveways, and other miscellaneous concrete areas shall be cured in conformance with any of the methods specified in SSS Section 90-1.03B, "Curing Concrete."
- C. Shotcrete shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in SSS Section 90-1.03B, "Curing Concrete."
- D. Mortar and grout shall be cured by keeping the surface damp for 3 days.
- E. After placing, the exposed surfaces of sign structure foundations, including pedestal portions, if constructed, shall be cured for at least 72 hours by spraying with water, or by a moist earth blanket, or by any of the methods provided in SSS Section 90-1.03B, "Curing Concrete."

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**END SECTION**

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**SECTION 03 41 00**  
**PRECAST CONCRETE STRUCTURES**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Work required under this section consists of furnishing and installing precast, reinforced concrete structures of the sizes and types called for on the Plans, complete with openings, inserts, and hardware.

*1.2 RELATED WORK*

- A. Section 03 30 00 – Cast-In-Place Concrete
- B. Section 03 60 00 – Grout
- C. Section 05 50 00 – Fabricated Metal
- D. Section 07 92 00 – Caulking and Sealants
- E. Section 31 05 00 – Common Work Results for Earthwork
- F. Section 35 20 16 – Water Control Gates
- G. Section 40 05 00 – Pipe and Fittings

*1.3 REFERENCES*

- A. American Concrete Institute (ACI)
- B. American Society for Testing and Materials (ASTM)
- C. State Standard Specifications
- D. California Building Code (CBC)

*1.4 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Manufacturer's descriptive details of the manufacturer's latest standard product proposed for use on this project, including, but not limited to:
  - 1. All principal dimensions.
  - 2. Knockout locations and dimensions.
  - 3. Hardware details.
  - 4. Certification that the cement conforms to ASTM C150.

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- C. Shop and erection drawings, including design criteria and calculations, locations and types of all inserts, and the locations of all openings and location and type of joints.
  - 1. The calculations and design drawings shall be stamped and signed by a civil or structural engineer registered in the State of California.

1.5 *DEFECTIVE WORK*

- A. Work considered to be defective may be ordered, by the Engineer, to be replaced in which case the Contractor shall remove and replace the defective work at his expense.

**PART 2 PRODUCTS**

2.1 *GENERAL*

- A. Design all precast structures as specified herein and in accordance with the applicable requirements of ASTM C913, except that Type II modified Portland cement shall be used.
  - 1. Comply with the provisions of Section 03 30 00 – Cast In Place Concrete.
- B. Structures shall be of the sizes and configurations shown on the Drawings, with openings as shown. Wall and floor thickness, roof thickness and joint location shall be determined by the fabricator.

2.2 *STRUCTURES*

- A. Concrete Vault, as manufactured by Jensen Precast, or Engineer approved equivalent

2.3 *GRATE AND FRAME*

- A. As shown on the Plans. Structural steel, ASTM A36, hot dip galvanized after fabrication, and in conformance with AASHTO M111-91.

**PART 3 EXECUTION**

3.1 *GENERAL*

- A. Precast structures shall be set vertically and in true alignment, at the elevations indicated and at the locations shown on the Plans.
- B. All holes in sections used for handling purposes shall be thoroughly plugged with rubber plugs or mortar.
- C. If starter couplings are not supplied, place pipe sections flush on the inside of the structure wall, projecting outside sufficiently for proper connection with the next pipe section.

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- D. Follow manufacturer's recommended installation procedures.

**END SECTION**

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**SECTION 03 60 00**  
**GROUT**

**PART 1 GENERAL**

1.1 *WORK INCLUDED*

- A. Epoxy grouting of anchor bolts and reinforcing bars to be installed in hardened concrete.
- B. Adhesive bonding of fresh concrete to existing hardened concrete surfaces.
- C. Installation of pipe and sleeve into existing concrete.
- D. Structure and Equipment leveling pads.

1.2 *RELATED WORK*

- A. Section 03 15 20 - Anchor Bolts and Expansion Anchors
- B. Section 03 30 00 - Cast-in-Place Concrete

1.3 *SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.

**PART 2 PRODUCTS**

Material Type	Approved Product
1. Non-shrinking Grout	L&M Chemical "Crystex", Gifford-Hill "Supreme", Master Builders "Masterflow 713 Grout" Sauereisen Cements "F-100 Level Fill Grout", U.S. Grout "Five Star Grout", UPCO "Upcon High Flow" or "Upcon Super Flow", or equal.
2. Epoxy Grout	
a. Adhesive, Moisture insensitive	
For floors and horizontal surfaces	Adhesive Engineering "Concresive 1539", Rescon "Concrete Bonder R616", or equal
For vertical walls or overhead applications, non-sagging consistency	Adhesive engineering "Concresive 1440" Rescon "Concrete Bonder R616" or equal
b. Aggregate	As recommended by the epoxy grout manufacturer
3. Epoxy Bonding Adhesive	Sikadur 32, Hi-Mod Master Builders Concresive Standard Liquid or equal.
4. Water	Clean and free from deleterious substances.

- A. Non-shrinking grout shall be furnished factory premixed, so only water is added at jobsite. Grout shall be mixed in a mechanical mixer. No more water shall be used than is necessary to produce a flowable grout.

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1. Cured grout shall have a minimum compressive strength of 3500 psi.
- B. Epoxy grout shall consist of a two component liquid epoxy adhesive of appropriate viscosity for the application and location and an inert aggregate filler component. Components shall be packaged separately at the factory and field mixed. All proportioning and mixing of the components shall be in accordance with the manufacturer's recommendations.
  1. Cured grout shall have a minimum compressive strength of 3500 psi.

**PART 3 EXECUTION**

**3.1 PREPARATION**

- A. The concrete surface to receive non-shrinking grout shall be saturated with water for 24 hours prior to grouting.
- B. Where indicated on the drawings, dowels shall be epoxy grouted in holes drilled into hardened concrete. Hole diameter shall be as recommended by the manufacturer. The embedment depth for epoxy grouted dowels shall be as indicated on the Plans.
- C. Holes shall be prepared for grouting as recommended by the grout manufacturer.
- D. The existing concrete surface to receive fresh concrete shall be clean and sound. The existing surface may be dry or damp, but free of standing water, free of dust, laitance, grease, airing compounds, and disintegrated materials. The existing concrete surface and rebar shall be sand blasted or cleaned by approved mechanical methods.

**3.2 INSTALLATION**

- A. Non-shrinking Grout
  1. Placement - Unless otherwise specified or indicated on the Plans, the thickness of grout shall be 1-1/2 inches. Grout shall be placed in strict accordance with the directions of the manufacturer.
  2. Edge Finishing - The grout shall be finished smooth in all locations where the edge of the grout will be exposed to view after it has reached its initial set. Except where indicated to be finished on a slope, the edges of grout shall be cut off flush at the base plate, bedplate, member, or piece of equipment.
  3. Curing – Non-shrinking grout shall be protected against rapid loss of moisture by covering with wet rags or polyethylene sheets. After edge finishing is complete, the grout shall be wet cured for at least 7 days.
  4. Epoxy Grout - Dowels shall be clean, dry, and free of grease and other foreign matter at time of installation. The bars shall be set and positioned and the epoxy grout shall be placed and finished in accordance with the recommendations of the grout manufacturer. Particular care shall be taken

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to ensure that all spaces and cavities are filled with epoxy grout, without voids.

- B. Epoxy Bonding Adhesive: Pre-mix each component as specified by manufacturer. Mix only that quantity that can be applied within its pot life. Apply as specified by manufacturer.

**END SECTION**

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**SECTION 05 05 20**  
**BOLTS, WASHERS, ANCHORS AND EYEBOLTS**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. This section describes materials and installation of anchor bolts, connecting bolts, washers, drilled anchors, epoxy anchors, screw anchors, eyebolts, and stainless steel fasteners.

*1.2 DESIGN CRITERIA*

- A. Structural Connections: AISC Specification for Structural Steel Buildings (June 22, 2010), except connection details are shown in the Drawings.

*1.3 REFERENCES*

- A. American Institute of Steel Construction (AISC)
- B. American Society for Testing and Materials (ASTM)
- C. Research Council on Structural Connections (RCSC)

*1.4 SUBMITTALS*

- A. Submit shop drawings in accordance with Section 01 33 00 – Submittals.
- B. Submit manufacturer's catalog data and ICC Evaluation Service Reports for bolts, washers, and concrete anchors. Show dimensions and reference materials of construction by ASTM designation and grade.
- C. Submit anchor bolt layout drawings.

**PART 2 PRODUCTS**

*2.1 GENERAL*

- A. Anchor bolts, drilled anchors and epoxy anchors for buried service, immersion service and in splash zones shall be stainless steel. All other anchor bolts, drilled anchors and epoxy anchors shall be galvanized steel unless otherwise specified on the Plans.

*2.2 ANCHOR BOLTS*

- A. Steel anchor bolts shall conform to ASTM F1554, Grade 36, Class 1A or 2A unless otherwise indicated. Size, length and thread length shall be as shown on the Drawings.

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- B. Bolts shall be provided with a head and two washers of a minimum of ¼ inch thick and 2 inches square. One washer shall be embedded in the concrete at the head of the bolt.
- C. Anchor bolts, nuts and washers shall be galvanized per ASTM F2329.

2.3 CONNECTION BOLTS

- A. Steel connection bolts shall conform to ASTM A325, Type 1 with the threads included in the shear plane.
- B. Provide galvanized bolts where shown in Drawings. Galvanizing of bolts, nuts, and washers shall be in accordance with ASTM F2329.

2.4 STAINLESS STEEL BOLTS

- A. Stainless steel bolts shall be ASTM A193, Grade B8 or ASTM F593, Type 316. Nuts shall be ASTM A194, Grade 316 or ASTM F594, Type 316. Use ASTM A194 nuts with ASTM A193 bolts; use ASTM F594 nuts with ASTM F593 bolts. Provide washer for each nut and bolthead. Washers shall be of the same material as the nuts.

2.5 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

- A. Lubricant shall be chloride free and shall be RAMCO TG-50, Anti-Seize by RAMCO, Huskey™ Lube-O-Seal by HUSK-ITT Corporation, or equal.

2.6 WASHERS

- A. Washers for bolts conforming to ASTM F1554 shall conform to ASTM F436, Type 1.
- B. Washers for bolts conforming to ASTM A307 shall conform to ASTM F844.
- C. Washers for bolts conforming to ASTM A325 shall be square or rectangular, tapered in thickness, smooth, hot-dipped galvanized, conforming to ASTM F436.
- D. Stainless steel washers shall be Type 316.

2.7 DRILLED ANCHORS

- A. Unless otherwise indicated in the Drawings, drilled anchors shall be 316 stainless steel wedge anchors as manufactured by ITW Red Head Trubolt+, Kwik Bolt TZ by Hilti, or equal. Anchors shall have ICC-approved testing.

2.8 EPOXY ANCHORS

- A. Epoxy anchors in concrete shall be 316 stainless steel threaded rod adhesive anchors. Adhesive shall be ITW Red Head Epcon S7, Hilti HIT RE 500-SD, or equal. Epoxy anchor assemblies shall be ICC approved.
- B. Epoxy anchors in grouted concrete masonry walls shall be 316 stainless threaded rods. Epoxy adhesive shall be Hilti HIT HY 70, Simpson ET-HP, or equal.

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**PART 3 EXECUTION**

**3.1 STORAGE OF MATERIALS**

- A. Store material, either plain or fabricated, above ground on platforms, skids, or other supports. Keep material free from dirt, grease, and other foreign matter and protect from corrosion.

**3.2 GALVANIZING**

- A. Zinc coating for bolts, anchor bolts, and threaded parts shall be in accordance with ASTM F2329.

**3.3 INSTALLING CONNECTION BOLTS**

- A. Use steel bolts to connect structural steel members. Use stainless steel bolts to connect structural aluminum members.
- B. Install ASTM A325 bolts and washers per the RCSC "Specification for Structural Joints Using High Strength Bolts".
- C. Bolt holes in structural members shall be 1/16 inch in diameter larger than bolt size. Measure cast-in-place bolt locations in the field before drilling companion holes in structural steel beam or assembly.
- D. Slotted holes, if required in the Drawings, shall conform to AISC 360-10, Chapter J, Section J3, Table J3.3.
- E. Drive bolts accurately into the holes without damaging the thread. Protect boltheads from damage during driving. Boltheads and nuts or washers shall rest squarely against the metal. Where bolts are to be used on beveled surfaces having slopes greater than 1 in 20 with a plane normal to the bolt axis, provide beveled washers to give full bearing to the head or nut. Where self-locking nuts are not furnished, bolt threads shall be upset to prevent the nuts from backing off.
- F. Bolts shall be of the length that will extend entirely through but not more than 1/4 inch beyond the nuts. Draw boltheads and nuts tight against the work.

**3.4 INSTALLATION OF STAINLESS STEEL BOLTS AND NUTS**

- A. Prior to assembly, coat threaded portions of stainless steel bolts and nuts with lubricant.

**3.5 INSTALLING ANCHOR BOLTS**

- A. Anchor bolts shall be delivered in time to permit setting before the structural concrete is placed. Anchor bolts which are cast in place in concrete shall be provided with sufficient threads to permit a nut to be installed on the concrete side of the concrete form or supporting template.
- B. Preset bolts and anchors by the use of templates. Do not use concrete anchors set in holes drilled in the concrete after the concrete is placed for mechanical equipment.

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Anchor bolts and threaded rod anchors which are to be epoxy grouted shall be clean and free of coatings that would weaken the bond with epoxy.

- C. Two nuts, a jam nut, and a washer shall be furnished for anchor bolts and threaded rod anchors indicated on the drawings to have locknuts; two nuts and a washer shall be furnished for all other anchor bolts.
- D. Anti-seize thread lubricant shall be liberally applied to projecting, threaded portions of stainless steel anchor bolts and threaded rod anchors immediately before final installation and tightening of the nuts.
- E. For static items such as storage tanks, use preset anchor bolts or drilled anchors with ICC report data.
- F. After anchor bolts have been embedded, protect projecting threads by applying grease and having the nuts installed until the time of installation of the equipment or metalwork.

**3.6 *INSTALLING DRILLED ANCHORS***

- A. Minimum depth of embedment of drilled mechanical anchors shall be as recommended by the manufacturer, but no less than that shown in the Drawings.
- B. Prepare holes for drilled anchors in accordance with the anchor manufacturer's recommendations prior to installation.

**3.7 *INSTALLING EXPOXY ANCHORS***

- A. Epoxy anchors shall be clean and free of coatings that would weaken the bond with epoxy.
- B. Minimum depth of embedment of epoxy anchors shall be as recommended by the manufacturer, but no less than that shown in the Drawings.
- C. Prepare holes for epoxy anchors in accordance with the anchor manufacturer's recommendations prior to installation.

**END SECTION**

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**SECTION 05 50 00**  
**FABRICATED METAL**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Provide metals work for trash rack, and other miscellaneous metal works, complete as indicated, specified and required.
1. Steel channel and/or angle frames and thresholds with anchors
  2. Handrails, guardrail, stairs and platform
  3. Grating
  4. Trench covers
  5. Pipe supports with saddles, hangers, bracing and attachments as detailed and required, except as provided by other trades.
  6. Guard post assemblies for removable and stationary types
  7. Miscellaneous iron and steel items indicated, specified, or required for completion of the Work, unless included under other Sections of the Specification
  8. Miscellaneous connections, anchors, bolts, clips, spacers, nuts, washers, shapes and inserts, as required.
  9. Galvanizing, shop primer finishes for work of this Section as specified or required, including field touchups.

*1.2 RELATED WORK*

- A. Section 03 15 20 – Anchor Bolts and Post-Installed Anchors
- B. Section 03 30 00 – Cast-In-Place Concrete
- C. Section 09 90 00 – Painting and Coating

*1.3 REFERENCES*

- A. Industry Codes and Standards

American Institute of Steel Construction (AISC)

Specification for the Design, Fabrication and Erection of Steel for Buildings

Code of Standard Practice for Steel Buildings and Bridges

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American Society for Testing and Materials (ASTM)

American Welding Society (AWS)

AWS D 1.1 Structural Welding Code Steel

B. Government Regulations

U.S. Department of Labor, Occupational Safety and Health Administration (OSHA)

Cal/OSHA Standards

1.4 *QUALITY ASSURANCE*

A. Unless otherwise specified all work specified herein and shown on the Drawings shall conform to the applicable requirements of the following specifications and codes:

1. Fabricate and erect miscellaneous metal work in accordance with the latest edition of the AISC "Specification for the Design, Fabrication and Erection of Steel for Buildings," and "Code of Standard Practice for Steel Buildings and Bridges."
2. Inspections. Perform all field welding and field high strength bolting of structural steel assemblies under the inspection of the Engineer. Notify the Engineer at least 48 hours in advance of needed inspections. Provide copies of testing and inspection reports to the Engineer.

1.5 *SUBMITTALS*

A. Furnish submittals, samples and material data in conformance with Section 01 33 00 – Submittal Procedures.

1. Shop Drawings and Erection Drawings. Show materials and specification list, construction and fabrication details, layout and erection diagrams and method of anchorage to adjacent construction. Give location, type, size and extent of welding and bolted connections and clearly distinguish between shop and field connections. Coordinate shop drawings with related trades to ensure proper mating of assemblies.
  - a. Catalog work sheets showing illustrated cuts of item to be furnished, scale details and dimensions may be submitted for standard manufactured items.
  - b. Where items must fit and coordinate with finished surfaces and/or constructed spaces, take measurements at site and not from Drawings. Where concrete, masonry or other materials must be set to exact locations to receive work, furnish assistance and direction necessary to permit other trades to properly locate their work. Where welded connectors, concrete, or masonry inserts are required to receive work, show on shop drawings exact locations required.

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2. Shop Painting Data. Submit product list with product data sheets of intended shop coats. These products shall be compatible with the products and manufacturers with those systems Specified in Section 09 90 00 - Painting.

**PART 2 PRODUCTS**

2.1 MATERIALS – GENERAL

- A. Provide materials that are new, sound and conforming to the following:

Item	ASTM Standard No.	Class, Grade Type or Alloy No.
<b>Cast Iron</b>		
Cast Iron	A48	Class 40B
<b>Steel</b>		
Galvanized sheet iron or steel	A653	Coating G90
Black steel, sheet or strip	A569 A570	--
Coil (plate)	A635	--
Structural plate, bars, rolled shapes, and miscellaneous items (except W and HSS shapes)	A36	--
Rolled W shapes	A992	Grade 50
HSS Shapes	A500	Grade B
Standard bolts, nuts and washers	A307	--
High strength bolts, nuts and hardened flat washers	A325 A490	--
Eyebolts	A489	Type 1
Tubing, cold-formed	A500	--
Tubing, hot-formed	A501	--
Steel pipe	A53	Grade B
<b>Stainless steel</b>		
Plate, sheet and strip	A240	Type 304* or 316**
Bars and shapes	A276	Type 304* or 316**

<b>Aluminum</b>		
Flashing sheet aluminum	B209	Alloy 5005-H-14, 0.032 inches minimum thickness
Structural sheet aluminum	B209	Alloy 6061-T6
Structural aluminum	B209 B308	Alloy 6061-T6
Extruded aluminum	B221	Alloy 6063-T52

\*Use Type 304L if material will be welded

\*\*Use Type 316L if material will be welded

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1. Anchor bolts and Post-Installed Anchors
  - a. Anchor bolts and post-Installed anchors shall conform to Section 03 15 20.
2. Galvanizing.
  - a. Iron and Steel. ASTM A123, with average weight per square foot of 2.0 ounces and not less than 1.8 ounces per square foot.
  - b. Ferrous Metal Hardware Items. ASTM A153 with average coating weight of 1.3 ounces per sq. ft.
  - c. Touch-up Material for Galvanized Coatings. Repair galvanized coatings marred or damaged during erection or fabrication by use of DRYGALV as manufactured by the American Solder and Flux Company, Galvalloy, Galvion, Rust-Oleum 7085 Cold Galvanizing Compound, or Engineer approved equivalent.
3. Welding Electrodes. Use welding electrodes conforming to AWS D1.1.
4. Shop Prime Paint. To assure compatibility with deferred field-applied paint or coating systems, for ferrous metals other than stainless steel, galvanized steel and cast iron, provide surface preparations and use shop prime paint product and manufacturer as painting or protective coating system intended for field application specified in Section 09 90 00 - Painting.
  - a. Do not shop prime portions of work immediately adjacent to intended field welds, or portions intended for embedment.

**PART 3 EXECUTION**

**3.1 GENERAL FABRICATION AND INSTALLATION REQUIREMENTS**

- A. Standards: Thoroughly clean ferrous metals of all loose scale and rust before being fabricated. Provide finished members free of twists, bends or open joints, and that present a neat workmanlike appearance when completed. Perform steel work conforming to the best practices set forth in the "Specifications for the Design, Fabrication and Erection of Structural Steel for Buildings" of the American Institute of Steel Construction.
  1. Perform aluminum work conforming to the applicable requirements of "Specifications for Aluminum Structures, Aluminum Construction Manual" of the Aluminum Association.
- B. Welding: Perform all welding in accordance with the "Structural Welding Code-Steel," AWS D1.1.
  1. Use only welders qualified by tests in accordance with AWS B 3.0.
- C. General Fabrication and Installation

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1. Using new stock of sizes specified or detailed, fabricate in shop producing high grade metal work. Form and fabricate to meet required conditions. Include clips, straps, bolts, screws, and other fastenings necessary to secure the work. Accurately make and tightly fit joining and intersections in true planes with adequate secure fastenings. Erect all metal work plumb, true on line and in its designated location. Grind and finish smooth field welds on exposed surface. Bolt or weld connections as indicated on Drawings. After installation, leave all work in a neat and clean condition, ready for field painting or coating.
  - a. The maximum misalignment tolerance for railing shall be 1/8 inch in 12 feet. Bent, deformed or otherwise damaged railings shall be replaced.
2. Coordinate work of this Section with related trades. Particular attention is required for items to be embedded in concrete work. Provide all punching and drillings indicated or required for attachment of other work to that of this Section.
3. Compliance with Safety Requirements: Dimensions required for the fabrication and installation of handrails, ladders, grating, plate, pipe hangers and etc. which are not shown on the Drawings, shall conform to the requirements of the Division of Occupational Health and Safety.

D. Protection

1. Provide protection and repair of adjacent surfaces and areas which may become damaged as a result of work of this Section. Protect work performed hereunder until completion and final acceptance of project by the Owner. Repair or replace all damaged or defective work to original specified condition, at no additional cost to the Owner.

E. Painting

1. Apply all products in strict conformance with manufacturer's printed instructions.
2. Provide one or more shop coats of paint on all ferrous metals, except cast-iron, ductile iron, stainless steel and galvanized metals. Before priming, thoroughly clean surfaces. Allow shop coats to dry before materials are loaded for delivery to the job site. After erection, paint all areas where the shop coats have been rubbed off or omitted.
  - a. See Section 09 90 00 – Painting and Coating of these specifications for surface preparation, prime coatings, finish painting and coatings.
3. Isolate aluminum members from contact with dissimilar metals, concrete and masonry to provide protection from electrolytic deterioration. Use non-absorptive tape or gaskets, heavy brush coat of approved zinc chromate primer made with a synthetic resin vehicle; or apply a heavy coat of approved alkali-resistant bituminous paint.

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**END SECTION**

FABRICATED METAL  
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**SECTION 07 92 00**  
**CAULKING AND SEALANTS**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Sealing and caulking at locations specified and indicated on the Plans.
- B. All labor, materials, equipment, tools and incidentals necessary and required for the completion of the work.

*1.2 RELATED WORK*

- A. Section 03 30 00 – Cast-in-Place Concrete
- B. Section 09 90 00 – Painting

*1.3 REFERENCES*

- A. American National Standards Institute/National Sanitation Foundation.
  - 1. ANSI/NSF Standard 61 - Drinking Water System Components - Health Effects.
- B. American Society for Testing Materials (ASTM):
  - 1. C 920 - Specification for Elastomeric Joint Sealants.
- C. Federal Specification (FS):
  - 1. FS TT-S-00227e - Sealing Compound, Elastomeric Type, Multi-Component.

*1.4 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittals.
- B. Shop Drawings:
  - 1. Shop Drawings, Product Data, and Samples.
  - 2. Applicator's qualifications.
  - 3. Product technical data including:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Manufacturer's installation instructions.
    - c. Manufacturer's recommendations for joint cleaner, primer, backer rod, tooling and bond breaker.

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4. Certification from sealant manufacturer stating product being used is recommended for and is best suited for joint in which it is being applied.
  5. Warranty.
- C. Samples:
1. Cured sample of each color for Engineer's color selection. Color chart not acceptable.

**PART 2 PRODUCTS**

**2.1 MATERIALS**

**A. POLYURETHANE COMPOUNDS**

1. Exterior Applications: One or two component polysulfide liquid polymer base rubber compounds, which cure at normal temperature to a flexible firm rubber, tack-free, paintable, in gun grade or knife or trowel consistency, conforming to ASTM C920-11, Type S, Grade NS, Class 35 for use in types T<sub>1</sub>, T<sub>2</sub>, NT, M, O, G, I, A..
  - a. DAP "Premium Polyurethane Construction Adhesive Sealant", Sika "Sikaflex 1a" or "Sikaflex 2c NS", WR Meadows "Pourthane NS", or Engineer approved equivalent.
2. Color of caulking and sealants shall match color of adjacent work.
3. Interior Applications: Butyl based compound, smooth flowing, single component, architectural grade, synthetic, general purpose caulking compound, composed of 80-100% solids, butyl, non-oily, non-hardening, curing to a tack-free surface, paintable, in gun grade or knife or trowel consistency.
  - a. DAP Butyl-Flex, Sika Sikaflex 1a or Engineer approved equivalent.
4. Horizontal Applications. Elastomeric, one-component, self-leveling polyurethane sealant conforming to ASTM C920-11, Type S, Grade P, Class 25 for use in types T<sub>1</sub>, T<sub>2</sub>, NT, M, O, G.
  - a. "Pourthane SL" WR Meadows, "Sikaflex+ Self-Leveling Sealant" or Engineer approved equivalent
5. Color of caulking and sealants shall match color of adjacent work.

**B. SILICONE SEALANTS**

1. Where silicone sealant is shown or noted on Plans or noted in the Specifications, it shall be a one part, type S, in gun grade consistency.

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- a. General Electrical 1200 Series, Dow Corning Number 795. or Engineer approved equivalent.
  2. Color of sealant shall match the color of adjacent work.
- C. ACRYLIC-LATEX SEALANTS
1. Permanently flexible, non-staining, and non-bleeding latex modified acrylic sealant compound.
    - a. Tremco Mono, Pecora Corp. Number AC-20, Sonneborn Sonolac or Engineer approved equivalent.
  2. Color of sealant shall match the color of adjacent work.
- D. PRIMERS
1. Primers shall be quick drying, colorless, non-staining sealer of type and consistency recommended by the manufacturer of the sealant material for the surfaces to be caulked and sealed.
- E. PACKING AND FILLERS
1. Closed-cell expanded sponge rubber manufactured from synthetic polymer neoprene base, or resilient polyethylene foam backer rod, compatible with the caulking compound used.
    - a. WR Meadows "Kool-Rod", Rubatex Corp. Rubatex-Cord or Engineer approved equivalent.
  2. Size: Minimum 25 percent greater than nominal joint width.

**PART 3 EXECUTION**

**3.1 EXECUTION**

**A. SCHEDULE**

1. Synthetic Rubber Sealing Compound (Polyurethane), Non-Sag:
  - a. Use where indicated on the Drawings.
  - b. Water-bearing and earth-bearing concrete structures.
  - c. Joints in masonry, concrete vertical surfaces, and metal-faced panels in vertical surfaces.
  - d. Joints between sheet metal flashing and trim.
  - e. Joints between sheet metal flashing and trim, and vertical wall surfaces.

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- f. Small voids between materials requiring filling for weather tight performance in vertical surfaces.
  - g. Surfaces in contact with bituminous materials in vertical surfaces.
  - h. Perimeters of frames of doors, windows, louvers, pipe penetrations.
2. Synthetic Rubber Sealing Compound (Polyurethane), Self-Leveling:
- a. Use where indicated on the Drawings
  - b. Expansion and control joints in masonry, concrete horizontal surfaces, and metal panels in horizontal surfaces
  - c. Small voids between materials requiring filling for weather tight performance in horizontal surfaces
  - d. Surfaces in contact with bituminous materials
  - e. Perimeters of frames, louvers, pipe penetrations in horizontal surfaces.
3. Silicone:
- a. Use where indicated on the Drawings.
  - b. Joints and recesses formed where window, door, louver and vent frames, and sill adjoin masonry, concrete, stucco, or metal surfaces.
  - c. Door threshold bedding.
  - d. Moist or wet locations, including joints around plumbing fixtures.
  - e. Plenum joints.
4. Acrylic Latex:
- a. Use where indicated on the Drawings.
  - b. Interior joints with movement less than 7.5 percent and not subject to wet conditions.

**B. STORAGE AND HANDLING**

- 1. Deliver, store, and handle products in accordance with manufacturer's recommendations.
- 2. Do not use material older than 6 months old. Store materials at temperatures lower than 80 degrees Fahrenheit



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C. APPLICATION AND WORKMANSHIP

1. Surface Preparation:

- a. Allow concrete to cure at least 14 days prior to applying caulking
- b. Joints and spaces to be caulked or sealed shall be completely cleaned of all dirt, dust, mortar, oil and other foreign materials which might adversely affect the caulking work. Where necessary, degrease with an approved solvent or commercial degreasing agent. Surfaces shall be thoroughly dry before application of caulking compounds.
  - 1) Preparation of surfaces to receive caulking compound shall conform to the caulking manufacturer's specifications.
- c. All joints shall be enclosed on three sides. Where adequate grooves for caulking have not been provided, suitable grooves shall be provided to the depth required or as indicated on Drawings and without damage to the adjoining work. No grinding shall be required on metal surfaces.

2. Application:

- a. General: Do not apply sealant on wet or frosty surfaces or when surface temperature is higher than 120 degrees Fahrenheit or lower than recommended by the manufacturer. Caulking and sealants shall be applied by experienced mechanics using specified materials and proper tools.
- b. Priming: Concrete, masonry, and other porous surfaces, and any other surfaces if recommended by the manufacturer, shall be primed before applying caulking and sealants.
- c. Packing: Joints and spaces deeper than ½-inch shall be filled with packing to within ½-inch of the surface. Then the joints shall be filled with caulking compound. There shall be a minimum of 3/8-inch in depth of caulking compound in all joints ½-inch in depth or deeper.
- d. Caulking and Sealant Compounds: Compounds shall not be used when they become too jelled to be discharged in a continuous flow from the gun. Modification of compounds by addition of liquids, solvents, or powders will not be permitted.
- e. Tools and Workmanship: Compounds shall be applied with guns, knives or trowels as required. Fill all voids and joints solid. Caulk around entire perimeter of each opening, unless shown or specified otherwise.
- f. Finishing: Caulked and sealed joints shall be neatly pointed on flush surfaces, and internal corners. Excess material shall be cleanly removed. Caulking where exposed, shall be free of wrinkles and

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uniformly smooth. Caulking and sealing shall be complete before final coats of paint are applied.

3. Cleaning: Clean surfaces of all materials adjoining caulked and sealed joints of any smears of compound or other soiling due to caulking applications.
- D. Miscellaneous Caulking and Sealing Work: The entire extent of caulking and sealing work is not necessarily fully or individually described here. Caulking shall be provided wherever required to prevent light leakage as well as moisture leakage.

**END SECTION**

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**SECTION 09 90 00  
PAINTING AND COATING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Field painting including surface preparation, surface protection, clean up, and/or other appurtenant work as indicated in the Contract Documents.
- B. All labor, materials, tools and equipment, and incidentals necessary and required for their completion.
- C. All pipe, fittings, equipment, and structures are to be field coated except for those specific exceptions contained in this specification or identified on the drawings. The painting schedule included at the end of this specification summarizes the surfaces to be coated, the required surface preparation, and the coating systems to be applied. Coating notes on the drawings are used to show exceptions to the schedules, to extend the limits of coating systems, or to clarify or show details for application of the coating systems.
- D. All coatings for potable water service shall be ANSI-NSF Standard 61 certified.

*1.2 RELATED WORK*

- A. Section 03 33 00 – Cast-in-Place Concrete

*1.3 SUBMITTALS*

- A. Shop Drawings, Product Data, and Samples: as specific in Section 01 33 00 – Submittals.
  - 1. Product technical data including:
    - a. Acknowledgement that products submitted meet requirements of standards referenced.
    - b. Performance criteria as required by the Engineer to determine quality.
    - c. Manufacturer's installation instructions and environmental parameters.
    - d. Material Safety Data Sheets.
    - e. Color samples.

*1.4 AIR QUALITY REGULATORY COMPLIANCE*

- A. All paint shall conform to the applicable air quality regulations at the point of application. Any paint material which cannot be guaranteed by the manufacturer to comply, whether specified by product designation or not, shall not be used.

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- B. The volatile organic compound (VOC) of coatings materials limits set forth in Rule 460.1 of the San Joaquin Valley Unified Air Pollution Control District shall apply to this project. The manufacturers' products listed in paragraphs 3.01 and 3.02 of this section have been selected on the basis of their apparent compliance with Rule 460.1; however, it shall remain the Contractor's responsibility to ensure that all coatings materials furnished are in compliance with all regulatory agencies.
- C. The product listed may meet the VOC requirement in the unthinned (as shipped) condition, but may exceed the VOC requirement if thinned to the manufacturer's allowable recommendations. In this situation, the product is not to be thinned beyond the limit indicated in Rule 460.1, and if the product cannot be suitably thinned for the intended application method or temperature requirements, it will be necessary to use another manufacturer's product subject to acceptance by the Engineer.
- D. It shall be the responsibility of the Contractor to ensure the compatibility of the field painting products which will be in contact with each other or which will be applied over shop painted or previously painted surfaces. Paint used in successive field coats shall be produced by the same manufacturer. Paint used in the first field coat over shop or field primed surfaces, or previously painted surfaces shall cause no wrinkling, lifting, or other damage to underlying paint.

1.5 *QUALITY OF WORK*

- A. All finishes shall be applied by skilled workmen in accordance with the best practices and standards of the painting trade. Brushes, rollers, all equipment, and the techniques used in applying finishes shall be of sufficient quality to assure the specified results. Work not conforming to this Specification shall be corrected by touching up or refinishing as directed by the Engineer.
- B. It is the purpose and intent of this Specification to cover the complete paint finishing of all exterior and interior surfaces as scheduled or specified and all surfaces which normally require a paint finish for corrosion resistance, weather protection, finished appearance or utility. Finished surfaces shall be of the type of finish, color sheen film thickness and quality specified.

1.6 *DELIVERY AND STORAGE*

- A. Painting materials shall be delivered to site in manufacturer's original containers with labels intact and seals unbroken. Painting materials and equipment shall be stored and protected against freezing and mixed in rooms assigned for that purpose. No chemicals, unauthorized thinners, or other materials, not included in the paint formulation shall be added to the paint for any purpose. All necessary precautions shall be taken to prevent fire. Rags or waste soiled with paint shall be removed from premises at end of each day's work, or shall be stored in covered metal containers.

1.7 *EQUIVALENT PRODUCTS*

- A. Whenever a coating is specified using the name of a proprietary product or the name of a particular manufacturer or vendor, the specified coating shall be understood as establishing the type and quality of coating desired.

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- B. Other manufacturers' products will be accepted provided sufficient information is submitted to allow the Engineer to determine that the coatings proposed are equivalent to those named. Proposed coatings shall be submitted for review in accordance with the Section 01 30 00 – Submittals.
- C. Requests for review of equivalency will not be accepted from anyone except the Contractor, and such requests will not be considered until after the contract has been awarded.
- D. Specific products for various applications shall be as specified in Part 2. In addition to the products named in Part 2, equivalent products of the following manufacturers will also generally be acceptable:

Ameron  
Carboline  
Devoe  
PPG (Pittsburgh)  
Sherwin Williams Co.  
Sinclair  
Tnemec  
Valspar

- E. Contractor shall provide verification that equivalent products are acceptable for the desired application.

1.8 *REFERENCE STANDARDS*

- A. SSPC – Society of Protective Coatings, Pittsburgh, PA
- B. ASTM – American Society For Testing And Materials, West Conshohocken, PA

**PART 2 PRODUCTS**

2.1 *GENERAL*

- A. All paint shall be the product of a recognized manufacturer exclusively engaged in the manufacture of painting material. All paints for wood and metal surfaces shall be well-ground and shall not skin, liver, curdle, or body excessively in the containers.
- B. The paint shall not show laps or unevenness of color or texture. When applied to vertical surfaces, it shall not sag.
- C. All exposed surfaces, including sides and edges, shall be painted. Hangers, brackets, fastenings and other miscellaneous items shall be painted with the same system as the adjacent material. Paint systems shall be in addition to shop primers.
- D. Paint shall be stored inside and shall be protected against freezing. No adulterant, unauthorized thinner, or other material not included in the paint formation shall be added to the paint for any purpose.

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- E. Paint used in successive field coats shall be produced by the same manufacturer. Paint used in the first field coat over shop painted or previously painted surfaces shall cause no wrinkling, lifting, or other damage to underlying paint. Any paint system shall be the product of a single manufacturer.
- F. All paint used for intermediate and finish coats shall be guaranteed by the paint manufacturer to be lead-free, mercury-free, and fume-proof. Where paint materials are referenced to Federal or military specifications, the reference shall define general type and quality required but is not intended to limit acceptable materials to an exact formulation.
- G. For each paint, the Contractor shall follow the paint manufacturer's specific application instructions. Upon the Engineer's request, the Contractor shall furnish the following application instructions.
  - 1. Surface preparation recommendations.
  - 2. Type of primer to be used.
  - 3. Maximum dry and wet mil thickness per coat.
  - 4. Minimum and maximum curing times between coats.
  - 5. Thinner to be used with each paint.
  - 6. Ventilation requirements.
  - 7. Atmospheric conditions during which the paint shall not be applied.
  - 8. Allowable methods of application.
  - 9. Maximum allowable moisture content and minimum age of plaster, concrete and wood surfaces at time of paint application.
  - 10. Curing time before submergence in water.
- H. The minimum number of coats and minimum total dry mil thickness of the system for each surface shall be as specified in the paint schedule.

**2.2 PAINTING SCHEDULE**

- A. A schedule is appended to this section listing the surface preparation, primer, finish and dry mil thickness to be used on each surface to be coated.

**2.3 PRIMERS AND PRETREATMENT**

- A. P-1 Epoxy Primer – Minimum dry thickness 4 mils. Devoe "Bar Rust 235H", Sherwin Williams "Macropoxy 646 FC Epoxy B58-600", or Tnemec 69-1211 "Hi-Build Expoxoline."

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- B. P-2 Rust Inhibitive, non-submerged – Minimum dry thickness 3 mils. Devoe "Devran 203 Waterborne Epoxy Primer", Sherwin Williams "Macropoxy 646 FC Epoxy B58-600" or Tnemec 135 "Chem Build."
- C. P-3 Rust inhibitive, submerged – Minimum dry thickness 4.0 mils. Devoe "Bar Rust 235H", Sherwin Williams "Macropoxy 646 FC Epoxy B58-600" or Tnemec 136 "Chem Build."
- D. P-4 Primer for Wood – Maximum of 400 sq. ft/gal. Devoe 2010-1200 "Ultra- Hide Durus Exterior Acrylic Primecoat", Sherwin Williams "A-100 Wood Primer B42W41" or Tnemec 151 "Elaso-Grip."
- E. P-5 Wallboard Primer – Maximum of 400 sq. ft/gal. Devoe 1060-1200 "Ultra- Hide Latex Primer- Sealer", Sherwin Williams "Preprite 200 Interior Latex Primer B28W200", or Tnemec 51-792 "PVA Sealer."
- F. P-6 High Build Acrylic – Maximum of 100 sq. ft/gal., Tnemec 180 WB Tneme-Crete, Sherwin Williams "Heavy Duty Block Filler B42W46".

2.4 INTERMEDIATE AND FINISH PAINTS

- A. F-1 Epoxy Resin - Minimum dry thickness 5 mils. Devoe "Bar Rust 235H", Sherwin Williams "Macropoxy 646 FC Epoxy B58-600", or Tnemec 69 "Hi-Build" epoxy.
- B. F-2 Gloss Acrylic Emulsion - Minimum dry thickness 2.0 mils Devoe " Devflex 4208 Waterbone Acrylic Enamel", Sherwin Williams "Shercryl Hi Performance Acrylic Gloss B66-300", or Tnemec 1028.
- C. F-3 Semi-gloss Acrylic Emulsion - Minimum dry thickness 2.5 mils Devoe "Devvflex 4216 HP Waterborne", Sherwin Williams "Shercryl Hi Performance Acrylic Semi-Gloss B66-350", or Tnemec 1029 "Tuf Cryl".
- D. F-4 High Build Epoxy (Substitute for Coal Tar) - Minimum dry thickness 6 mils. Devoe "Devtar 5A HS", Sherwin Williams "Targuard Coal Tar Epoxy B69B60", or Tnemec "V69F Black"
- E. F-5 Polyurethane O - Minimum dry thickness 2 mils. Devoe "Devthane 379H Aliphatic Urethane Gloss Enamel", Sherwin Williams "Hi Solids Polyurethane CA B65j-300", or Tnemec 1075 "Endurasheild."
- F. F-6 Acrylic Epoxy – Minimum dry film thickness 4 mils. Tnemec 113 Tneme-Tufcoat, Sherwin Williams " Waterbased Tile Clad Epoxy B73-100".
- G. F-7 High Build Acrylic – Maximum of 100 sq. ft./gal. Tnemec 180 WB Tneme-Crete, Sherwin Williams "Heavy Duty Block Filler B42W46".

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2.5 *FUSION BONDED EPOXY LINING AND COATING*

- A. Fusion bonded epoxy linings and coatings shall be per Specification Section 09 97 61.

2.6 *ALUMINUM SURFACES*

- A. All aluminum in contact with steel or concrete: Sherwin Williams "Macropoxy 646 FC Epoxy B58-600 series or approved equivalent..

2.7 *SURFACES NOT TO BE PAINTED*

- A. Except as otherwise required or directed, the following surfaces are to be left unpainted:
1. Exposed surfaces of aluminum.
  2. Polished or finished stainless steel. Unfinished stainless steel shall be painted.
  3. Nickel or chromium.
  4. Galvanized surfaces, except piping, conduit, electrical conduit, pipe supports, fasteners, hangers, bracing, brackets, and accessories.
  5. Rubber and plastics, including fiberglass reinforced plastics.
  6. Precast concrete.

2.8 *SYSTEM IDENTIFICATION*

- A. Above Grade Piping: Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, either by preprinted marker or stenciled marking, and include arrows to show the direction of flow. Comply with ANSI A13.1 for colors. Locate markers at ends of lines, near major branches and other interruptions including equipment in the line, where lines pass through floor, walls or ceilings or otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portion of lines. Marking of short branches and repetitive branches for equipment connections is not required.
- B. Equipment: All equipment shall be identified with a plastic laminated, engraved nameplate which bears the unit mark number as indicated on the drawings (e.g. AC-4). Provide ½-inch high lettering, white on black background. Nameplates shall be permanently secured to the unit.
- C. Valves: Provide valve tags on all valves of each piping system, excluding check valves, valves within equipment, faucets, stops and shut-off valves at fixtures and other repetitive terminal units. Provide brass tags or plastic laminate tags. Prepare and submit a tagged valve schedule, listing each valve by tag number, location and piping service. Mount in glazed frame where directed.

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2.9 PIPING IDENTIFICATION

- A. Pipe shall be color coded according to the following schedule. Bands shall be 6 inches wide spaced along the pipe at 5-foot intervals. Depth of water gauges shall be painted as indicated on the Plans.

<u>LETTERS</u>	<u>COLOR OF PIPE</u>	<u>COLOR OF LETTERS</u>
Potable water	Light Blue	Black
Non-Potable water	Light Blue with Black Bands	Black
Grit	Dark Blue with Orange Bands	White
Air	Light Green	Black
Sludge	Light Brown	White
Scum	Dark Brown	White
Drain	Dark Gray	White
Reclaimed water	Purple	Black

- B. Electrical conduit shall be painted to match adjacent ceiling or wall surfaces as directed by the Engineer.

C. Item	Paint Color
Valve handwheels and levers	Red

**PART 3 EXECUTION**

3.1 PRELIMINARY EXAMINATION

- A. Notify the Engineer in writing of any uncorrected defects in surfaces to be painted. Do not proceed with the finishing of surfaces in question until any discrepancies are corrected. No work on any surface shall be started, unless the surface has been inspected and approved for painting by the Engineer.

3.2 SURFACE PREPARATION

- A. The Contractor shall prepare the surfaces to be coated as specified under the paint schedule. Any surfaces to be coated which are not listed under the paint schedule shall be prepared in accordance with the manufacturer's instructions for the material to be applied.
- B. All grease, oil, dirt, and other contaminants which may affect the bond between the coating and the surface shall be removed by a cleaning agent which will leave the surface clean and dry.
- C. Cleaning and painting operations shall be performed in a manner which will prevent dust or other contaminants from getting on freshly painted surfaces.
- D. Surfaces shall be free of cracks, pits, projections, or other imperfections which would prevent the formation of smooth, unbroken paint film, except for concrete block construction where a rough surface is an inherent characteristic.

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- E. When applying touch-up paint, or repairing previously painted surfaces, the surfaces to be painted shall be cleaned and sanded or wire brushed in such a manner that the edges of adjacent paint are feathered or otherwise smoothed so that they will not be noticeable when painted. All paint made brittle or otherwise damaged by heat or welding shall be completely removed.
- F. Hardware items such as bolts, screws, washers, springs, and grease fittings need not be cleaned prior to painting if there is no evidence of dirt, corrosion, or foreign material.
- G. All galvanized surfaces shall have a metal conditioner applied prior to the first prime coat.
- H. All surfaces to be finished shall be clean and dry before any materials are applied. Use a moisture meter to determine moisture content as follows. The moisture content shall be less than 18% for wood; 8% for concrete or plaster.
  - 1. Metal Surfaces – Where noted, the surface preparation for steel and other metals refer to the specifications for surface preparation by the latest revision of the Steel Structures Painting Council. All metal work shall be cleaned of grease, oil and dirt by solvent cleaning (SSPC-SP1). Do not use hydrocarbon based solvents for cleaning prior to use of acrylic materials.
    - a. Method SP-2: Surface shall be wire brushed where required to remove loose rust and dirt, etc. (SSPC-SP2)
    - b. Method SP-3: Removal of loose rust, loose mill scale and other detrimental foreign matter to degree specified by power wire brushing, power impact tools or power sanders. (SSPC-SP3)
    - c. Method SP-6: Blast cleaning until at least two-thirds of each element of surface area is free of all visible residues. (SSPC-SP6)
    - d. Method SP-10: Sandblast to near white condition. This method shall remove all rust and scale, but streaks and shadows in the metal will be acceptable. (SSPC-SP10)
  - 2. Wood Surfaces
    - a. Method W-1: All unprimed millwork delivered to the jobsite shall be given the specified first coat on all surfaces immediately upon arrival. Give all unprimed woodwork the specified first coat as soon as possible following installation. Prime any wood surface that is to be in contact with concrete, or a caulking material, with the specified first coat material before installation. Unless specified otherwise, all casings and trim, and all woodwork shall be free of oil, dirt, loose fibers, etc., sealed with a sanding sealer recommended by the coating manufacturer, and sanded smooth and dusted thoroughly before application of the priming coat. Give all knots, pitch pockets and sappy areas a preliminary coat of Dutch Boy Knot Sealer, or approved equivalent, prior to application of the prime coat.

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3. Galvanized Surfaces
  - a. Method G-1: All galvanized surfaces shall be prepared for painting in strict conformity with the instructions of the manufacturer. All galvanized shall be cleaned per SSPC-SP7.
4. PVC Pipe
  - a. Method V-1: All wax and oil shall be removed from PVC plastic surfaces by wiping with a solvent of the type used for the specified primer.

3.3 *PAINT APPLICATION*

- A. Apply all finishes evenly, free from sags, runs, crawls, brush marks, skips or other defects. Apply products at the proper consistency and do not thin or otherwise alter them except in accordance with the manufacturer's printed directions. All coats shall be applied in such manner as to produce an even film of uniform thickness completely coating all corners and crevices. All painting shall be done by thoroughly experienced workmen.
- B. Care shall be exercised during spraying to hold the nozzle sufficiently close to the surfaces being painted to avoid excessive evaporation of the volatile constituents and loss of material into the air, or the bridging over of crevices and corners. Spray equipment shall be equipped with mechanical agitators, pressure gauges, and pressure regulators. Nozzles shall be of proper size. Floors, roofs, and other adjacent areas and installations shall be satisfactorily protected by drop cloths or other precautionary measures. All over-spray shall be removed by approved methods or the affected surface repainted. Care shall be exercised to avoid lapping of paint on hardware of other unscheduled surfaces.
- C. Each coat of material shall be thoroughly dry before the application of a succeeding coat. In no case shall paint be applied at a rate of coverage per gallon which is greater than the maximum rate recommended by the manufacturer. Paint films showing sags, checks, blisters, teardrops, or fat edges will not be accepted. Paint containing any of these defects shall be entirely removed and the surface repainted.
- D. Sandpaper enamels and varnishes lightly between coats and dust thoroughly before the application of a succeeding coat.
- E. If the finish coat is to be colored, the prime coat and the intermediate coat shall be tinted to have a slight variation in color from each other and from the finish coat.

3.4 *PRIMING*

- A. Edges, corners, crevices, welds, and bolts shall be given a brush coat of primer before the specified spot or touch-up painting of metal surfaces. Special attention shall be given to filling all crevices with paint.
- B. Abraded and otherwise damaged portions of shop applied paint shall be repainted. Welded seams and other uncoated surfaces, heads and nuts of field installed bolts,

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and surfaces where paint has been damaged by heat, shall be given a coat of the specified primer. This patch, spot, or touch-up painting shall be completed, and shall be dry and hard, before additional paint is applied.

3.5 *LATEX PAINT*

- A. Latex paint shall be applied by brushing or rolling; spraying is not permitted. Latex paint shall not be thinned excessively.

3.6 *MIXING AND THINNING*

- A. Paint shall be thoroughly mixed each time any is withdrawn from the container. Paint containers shall be kept tightly closed except while paint is being withdrawn.
- B. Unless otherwise authorized, all paint shall be factory mixed to proper consistency and viscosity for hot weather application without thinning. Thinning will be permitted only as necessary to obtain recommended coverage at lower application temperatures. In no case shall the wet film thickness of applied paint be reduced, by addition of paint thinner or otherwise, below that represented by the recommended coverage rate.

3.7 *FILM THICKNESS FOR FERROUS METALS*

- A. It is intended that the dry film thickness and the continuity of painted ferrous metal surfaces be subject to continual field check by the Engineer. Dry film thickness shall be measured by the Contractor, using an approved Thickness Gauge, at locations selected by Engineer. Testing equipment provided shall be provided by Contractor and kept on site.
- B. Measurement of dry coating thickness shall conform with paint application Standard SSPC-PA2
- C. Thickness and Holiday Checking: Thickness of coatings and paint shall be checked with a non-destructive, magnetic type thickness gauge.
- D. Holiday Checking of all interior coated surfaces shall be tested with an approved holiday detection device. Non-destructive holiday detectors shall not exceed 100 volts nor shall destructive holiday detectors exceed the voltage recommended by the manufacturer of the coating system. For thicknesses between 10 and 20 mils (0.25mm and 0.50mm) a non-sudsing type wetting agent such as Kodak Photo-Flo, shall be added to the water prior to wetting the detector sponge. All pinholes shall be marked, repaired in accordance with the manufacturer's printed recommendations and re-tested. No pinholes or other irregularities will be permitted in the final coating. Holiday detection devices shall be operated in the presence of the Engineer.
- E. Continuity shall be tested by a low voltage-wet sponge per RPO 188. Contractor shall perform continuity tests as required by the Engineer on surfaces that will be submerged.

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3.8 *ATMOSPHERIC CONDITIONS*

- A. Apply all material to dry and properly prepared surfaces when weather conditions are favorable for painting. No materials shall be applied when the temperature of the materials is below 50° F, or when the temperature of the air, surface to be painted or substrate, is below (or likely to fall below) 50° F. Final ruling on the favorability of weather conditions shall be in accordance with the recommendations of the manufacturer and/or the Engineer.
- B. No coating or paint shall be applied to wet or damp surfaces, in rain, snow, fog, or mist, when the steel temperature or surrounding air temperature is less than five degrees above the dew point, nor in conditions not recommended by the manufacturer.

3.9 *REPAIRING DAMAGED PAINT ON EQUIPMENT*

- A. Painted surfaces on equipment, which have become damaged prior to acceptance by the Owner, shall be repainted with the same or equivalent paint used in the original application.

3.10 *PROTECTION OF SURFACES*

- A. Throughout the work the Contractor shall use drop cloths, masking tapes, and other suitable measures to protect all surfaces from accidental spraying, splattering, or spilling of paint. Contractor shall be liable for and shall correct and repair any damaged condition resulting from its operations or from the operations of all those who are responsible to the Contractor during the time its work is in progress and until the work is accepted. In case bituminous paints are spilled or dropped on any material except metals, the spots shall, after surface cleaning, be spot painted with aluminum paint prior to applying the specified paint. Any exposed concrete or masonry not specified to be painted which is damaged by paint shall be either removed and rebuilt or, where so authorized by the Owner, painted with two coats of masonry paint.

3.11 *CLEANUP*

- A. All cloths and cotton waste which might constitute a fire hazard shall be placed in metal containers or destroyed at the end of each work day. Upon completion of the work all staging, scaffolding and containers shall be removed from the site or destroyed in a manner approved by the Engineer.

3.12 *PAINTING SCHEDULE*

<u>SYSTEM</u>	<u>SURFACE</u>	<u>FINISH</u>			
		<u>SURF. PREP.</u>	<u>PRIME COAT</u>	<u>2<sup>ND</sup> COAT</u>	<u>3<sup>RD</sup> COAT</u>
1.	New ferrous metal in submerged or damp environment including all	SP-10	P-1	F-1	F-1

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	submerged mechanical components.				
2.	All exterior exposed new structural and miscellaneous steel. All exterior exposed surfaces of new piping, pumps, motors, electrical equipment and other unsubmerged mechanical and structural items.	SP-2 or 3	P-2	F-2	F-2
3.	All surfaces of new structural and miscellaneous steel pipe, pumps, motors and electrical equipment panels exposed inside building.	SP-6	P-2	F-3	F-3
4.	All interior exposed new galvanized metalwork including electrical conduit inside buildings, including fittings, boxes, supports and accessories.	G-1	P-3	F-3	F-3
5.	All exterior exposed new galvanized metalwork including roof flashings and other architectural items.	G-1	P-3	F-2	F-2
6.	Exposed new PVC piping	V-1	F-5	F-5	

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<u>SYSTEM</u>	<u>SURFACE</u>	<u>FINISH</u>			
		<u>SURF. PREP.</u>	<u>PRIME COAT</u>	<u>2<sup>ND</sup> COAT</u>	<u>3<sup>RD</sup> COAT</u>
7.	All new buried valves and flanged joints and other buried miscellaneous ferrous piping and metal surfaces (excluding cast iron pipe). All exterior surfaces of new cast iron and steel piping exposed in manholes, wet wells and similar locations, including valves, fittings, flanges, bolts, supports, and accessories. Miscellaneous new castings, including manhole rings and covers and manhole steps. (One coat, if not foundry dipped.)	SP-10	F-4	F-4	
8.	Interior wood	P-4	F-2	F-2	
9.	Exterior wood	P-4	F-3	F-3	
10.	Interior dry wall	P-5	F-6		
11.	Exterior concrete block	P-6	F-7		
12.	Concrete	P-6	F-7		

3.13 CONFLICTS

- A. When conflicting painting specifications or requirements are encountered in the contract documents, the more restrictive specifications or requirements shall be required.

**END SECTION**

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**SECTION 31 05 00**  
**COMMON WORK RESULTS FOR EARTHWORK**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Excavate earth and rock as necessary to allow the installation or construction of various items of work regardless of character and subsurface conditions.
- B. Haul, place, rough grade, compact, and finish grade imported and/or excavated on-site material (including recycled materials) on those portions of the project site where it is necessary to construct the facilities other than utilities indicated on the Plans. This includes under structures and preparation of subgrade for concrete, roadway, parking area, and embankments.
- C. Haul and dispose of excess and unsuitable material off-site or in designated areas, as directed by the Engineer.

*1.2 RELATED WORK*

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 43 00 – Quality Control and Testing
- C. Section 01 51 36– Watering
- D. Section 01 57 23 – Storm Water Pollution Prevention Plan
- E. Section 01 57 27 – Dust Control
- F. Section 02 41 00 – Demolition
- G. Section 31 11 00 – Clearing and Grubbing
- H. Section 31 23 17 – Trenching, Backfilling, and Compacting
- I. Section 31 23 35 – Disposal of Materials
- J. Section 32 11 23 – Aggregate Base

*1.3 REFERENCES*

- A. ASTM International (ASTM)
  - 1. C136 – Sieve Analysis of Fine and Coarse Aggregates.
  - 2. D75 Standard Practice for Sampling Aggregates
  - 3. D1556 – Density of Soil and base rock in Place by Sand-Cone Method

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4. D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort 56,000 ft-lbf/ft<sup>3</sup> (2,700kN-m/m<sup>3</sup>)
  5. D6938 – Density of soil and base rock in place by Nuclear method.
  6. D2937 – Density of soil and in place by Tube method.
- B. California Department of Transportation
1. State Standard Specifications
    - a. Section 10-6 Watering
    - b. Section 15 Existing Facilities
    - c. Section 17-2 Clearing and Grubbing
    - d. Section 18 Dust Palliatives
    - e. Section 19 Earthwork
    - f. Section 26 Aggregate Bases
- C. Code of Federal Regulations
1. 29CFR1926, Subpart P – Excavations

1.4 *SUBMITTALS*

- A. Submit plans as required for worker protection against caving ground in excavations. Submittals shall be in accordance with Section 01 33 00.
- B. Description of methods and equipment to be used for rock removal.

1.5 *SAMPLES*

- A. Submit samples under provisions of Section 01 33 00.

1.6 *PROTECTION*

- A. Protect excavations by shoring, bracing, sheet piling, underpinning, or other methods required to prevent cave-in or loose soil from falling into excavation.
  1. Trenches shall have sloping, sheeting, shoring, and bracing conforming with Subpart P, CAL/OSHA requirements, and the Contract Documents.
- B. Notify Engineer of unexpected subsurface conditions.
- C. Underground utilities may exist at this site. Contractor shall take all necessary precautions to protect said utilities. Notify Engineer of any deviation in utility location from that which is shown on the drawings.

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- D. Protect bottom of excavations and soil adjacent to and beneath foundations from frost.
- E. Grade excavation top perimeter to prevent surface water run-off into excavation.

1.7 CONTROL AND DIVERSION OF WATER

- A. The Contractor shall control and divert water as specified in Section 31 23 19
- B. The Contractor shall furnish or procure all materials and labor required for constructing and maintaining all necessary cofferdams, channels, flumes, drains, sumps, and/or other temporary diversion and protective works and shall furnish, install, maintain, and operate all necessary pumping and other equipment for removal of water from the various parts of the work and for maintaining the foundations and other parts of the work free from water.
- C. Prior to beginning any work on the removal of water from foundations, the Contractor shall submit for the Engineer's approval a water control plan showing his proposed method for the removal of water from foundations and other parts of the work.
- D. Devices to control and divert water shall be adequately filtered to prevent the removal of fines from the soil.
- E. Repair any damage caused by the failure of any part of equipment to control and divert water. Remove temporary equipment to control and divert water when no longer needed for dewatering purposes.
- F. Provision of equipment to control and divert water shall be considered part of the project with no additional compensation allowed.
- G. Any drain rock required in the trench bottom to convey water or stabilize wet soil shall be included at no extra cost to the Owner.

1.8 QUALITY ASSURANCE

- A. Compaction Testing:
  - 1. All compaction testing and reports shall be in accordance with Section 01 43 00 and submitted in conformance with Section 01 33 00.
  - 2. Compaction tests will be performed for each lift or layer.
  - 3. Tests for compaction shall conform to ASTM D1557.
  - 4. Sample aggregates to be used for backfill materials per ASTM D75 and test them per ASTM C136.

1.9 DEFINITION

- A. Unsuitable Material – Unsuitable material is material determined to be:

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1. Impossible to compact to specified density using ordinary methods at optimum moisture content.
2. Material containing trash, debris, oversized material or other foreign and objectionable materials.
3. Too wet to be properly compacted if circumstances prevent satisfactory in-place drying prior to incorporation into the work.
4. Non-native material containing a significant amount of permeable materials, such as sand or rock, that cannot be blended with other material and requires to be off hauled.
5. Expansive clays that cannot be mixed or treated and requires to be off hauled.
6. Otherwise unsuitable for the planned use.

*1.10 PROJECT CONDITIONS*

- A. The existing project sites typically have more sandy material but may encounter clay or silty material.
- B. Arrange construction sequences to provide the shortest practical time that excavations will be open to avoid hazard to the public, and to minimize the possibility of excavation collapse.

*1.11 CLASSIFICATION*

- A. Expected material that will be excavated at this site has been identified in the Geotechnical Report.
- B. Regardless of the nature of material excavated, all excavation will be considered unclassified.

**PART 2 PRODUCTS**

*2.1 SOIL*

- A. Native Soil: Original surface soil typical of the area.
- B. Topsoil: Capable of supporting native and specified plant growth.
- C. Backfill: All backfill material shall be approved before use and be free of cinders, ashes, ice, frozen soil, large hard clods, organic debris, or other deleterious items.
- D. Engineered Fill: fill materials for all fill areas shall be as required by State Standard Specifications, Section 19-3.

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- E. Embankment Fill: Fill materials for use in construction of roadway embankments should be non-expansive, free of organic matter and granular in nature, within the following limits:

<u>Sieve Size</u>	<u>Percent Passing</u>
3 in.	100
No. 4	80-100
No. 200	30-80
R-Value	50 (min.)
Plasticity Index	<10
Expansion Index	<10

All materials for roadway embankments shall be non- to low-corrosive in nature.

- F. Imported Soil: Before importing borrow, use all suitable material obtained from excavation work and recycling operations (if used). See Section 32 11 23 - Aggregate Base.

2.2 GRANULAR BACKFILL AND AGGREGATES

- A. Granular Backfill: material meeting the requirements of State Standard Specifications Section 19-3.02C.
- B. Class 2 Aggregate Base: material as specified for ¾" maximum grading in the State Standard Specifications, Section 26-1.02B.
- C. Material from concrete crushing operations may be used as granular backfill provided it meets the above requirements.
- D. Gravel: Pit run, natural stone; free of shale, clay, friable materials and debris; graded in accordance with 1½" x ¾" aggregate grading in Section 90-1.02C, State Standard Specifications.
- E. Structural Bedding Pea Gravel: Natural stone; washed, free of clay, shale, organic matter; ¼" minimum to 3/8" maximum size per State Standard Specifications Section 90-1.02C(4)(a).
- F. Sand: Natural river or bank sand; free of silt, clay, loam, friable or soluble materials, and organic matter, graded in accordance with State Standard Specifications Section 90-1.02C(4)(c):

2.3 CONCRETE SLURRY

- A. Concrete slurry mix shall be as specified in Section 03 30 00, Cast in Place Concrete.

2.4 ENGINEERED FILL MATERIAL UNDER STRUCTURES

- A. Common Fill Material (native material) is not acceptable for use as Engineered fill under any structure, tank, tank ring wall, or concrete slab. All subgrades for concrete

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structures or slabs shall incorporate 6" of aggregate base at the surface directly below the structure or slab.

- B. Pulverized asphalt concrete may not be incorporated into engineered fill under structures
- C. Portland cement concrete may be incorporated into engineered fill provided no rock pockets or voids are produced. Particles larger than three inches shall be removed from engineered fill.
- D. All imported fill material placed in structural areas shall consist of predominantly granular soil that is non-expansive and shall be approved by the Engineer prior to use.
- E. The R-value of the imported fill material shall be at least 50.

2.5 *WATER*

- A. As specified in Section 01 51 36, Watering.

2.6 *ROLLERS*

- A. Rollers used for compacting earth materials shall have staggered and uniformly spaced tamping feet and be of sufficient weight for proper compaction.
- B. The tamping heads and cleaner bars shall be properly maintained, and the spaces between the tamping feet shall be kept clear of materials which impair the effectiveness of the tamping rollers.

2.7 *TAMPERS*

- A. Where hand or power tampers are used to compact soils in confined areas such as under pipe, they shall be equipped with suitably shaped heads to obtain the required density.

2.8 ***BAISN / CANAL EMBANKMENTS***

- A. Canal embankment fill shall use the materials in compliance with the following requirements:
  - 1. Contain a minimum fines content of 20%;
  - 2. Contain no rocks larger than 4-inches;
  - 3. Have a PI range between 10 and 25.
  - 4. Material used outside of the inner 8-foot section of the embankment has the same requirements as the inner 8-foot section with the following exception: rocks up to 6-inches are allowed granted they are sufficiently mixed with smaller grained material and the larger rocks are not nested together.

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5. If expansive clays (PI greater than 25) are present, the material shall be mixed with lower plasticity material and/or treated with lime. If non-plastic material (PI less than 10) is present, the material shall be blended with higher plasticity material. The determination of the presence of high plasticity or low plasticity material that will require treating and/or blending will be at the discretion of the Owner's Representative.

**PART 3 EXECUTION**

**3.1 GROUND SURFACE PREPARATION**

- A. Complete demolition, clearing and grubbing as specified in Sections 02 41 00 and 31 11 00 including removal of any slabs, paving, trees, bushes, shrubs, stumps, roots, buried objects, or any objects that interfere with construction of the project structures, or as required by the Engineer.
- B. For basin and canal embankment work, complete all grubbing and topsoil stripping. Scarify and re-compact the stripped ground.

**3.2 INSPECTION**

- A. Verify stockpiled fill to be reused is approved. Provide samples for testing, if required.

**3.3 GENERAL**

- A. Identify required lines, levels, contours, and datum.
  1. Stake and identify the extent of all earthwork operations prior to starting work.
- B. Provide required shoring, sheeting, and slope layback necessary to protect the excavation, as needed, for the safety of the employees and as required by applicable State and Federal laws. Provide suitable barricades for public safety, regardless of excavation depth.
- C. Use suitable material removed from excavation before importing fill.
- D. Upon completion of excavation and before placing forms or structures, notify the Engineer who will inspect the excavation and may take tests to determine relative compaction.
- E. Verify areas to be backfilled are free of debris, snow, ice, or water, and surfaces are not frozen.
- F. Unless noted otherwise in the geotechnical report or the contract documents the Contractor shall comply with the following minimum compactions:
  1. Areas under flatwork, pavement, and structures shall be compacted to minimum of 95% relative compaction.

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2. Areas under embankments, scarification depth shall be a minimum of 12 inches recompacted to a minimum of 95% of maximum density.
3. All other fill and disturbed surfaces shall be compacted to a minimum of 90% relative compaction.

3.4 *MOISTURE CONTROL*

- A. Water development, hauling, and application shall be in accordance with Section 01 51 36, Watering.

3.5 *EXCAVATION*

- A. Excavate the specified areas to lines and grades as shown on the Plans or as directed by the Engineer.
- B. Carefully excavate to the established lines and grades shown on the drawings, or as revised and approved by the engineer, to provide a firm, uniform, and unyielding foundation for the proposed structures.
- C. If the Plans require placement of fill prior to pipe or structure excavation, the fill shall first be constructed to the design grade shown for a distance each side of the pipe or structure of not less than five times the diameter of the pipe or the width of the structure, after which the trench shall be excavated, and the pipe or structure installed.
- D. Paved Areas: Sawcut existing pavement to full depth to a clean, straight line before excavation and maintain the edge suitable for repaving.
- E. Excavate for all foundations, slabs, curbs, walks and/or similar work.
- F. Excavations for all footings, piers, finished walls and grade beams shall be sufficiently large so that forms for concrete may be properly placed, removed, and inspected.
  1. Excavation for footings may be made to the net footing size plus two inches if the side walls of the excavation are sufficiently stable to remain in position until the concrete is in place and if approved by the Engineer.
- G. Where over excavation is not required, the exposed surface under flatwork, pavement and structures shall be scarified to a depth of twelve inches, conditioned to optimum moisture content and compacted to at least 95 percent of the maximum dry density.
- H. If any existing foundations, roots, stumps, debris, waste materials, pipes, or similar items have been removed, the Contractor shall excavate below these portions to solid undisturbed earth and foundations in these areas shall be built to necessary levels.
- I. If soil conditions in excavations are not in accordance with the geotechnical report and seem to indicate that footings need not be carried down as deep as shown, or



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must be carried deeper, the changes shall be made by the Contractor after approval by the Engineer.

- J. Over excavation shall be required a minimum of 2 feet below top of subgrade under proposed pavement and structures, all concrete slabs, etc., unless shown otherwise on the Plans.
- K. Canal Excavation
1. Care shall be taken to prevent over breakage or loosening of material on bottoms or side slopes upon or against which lining is to be placed. Where the original ground surface is below the grade of the canal, the bottom of the canal shall be over filled, compacted, and subsequently trimmed to the underside of the lining as prescribed for constructing and compacting the canal embankments.
  2. Except as provided below, the canal shall be excavated to a subgrade and section as shown on the drawings to provide for the prescribed thickness of lining or Rip Rap.
  3. If hardpan is penetrated during the excavation of the canal prism, the entire cross-section shall be lime treated to a depth of at least 2 feet, perpendicular to the finished surface.
  4. Where unsuitable material is encountered in the foundation, the material will be quantified by both the Owner's Representative and the Contractor, then the Contractor shall perform additional excavation to remove the unsuitable material and the unsuitable excavated material shall be wasted in accordance with Section 31 23 35 Disposal of Materials.
  5. This additional excavation shall be refilled with suitable material to the underside of the lining as prescribed for constructing and compacting canal embankments. "Unsuitable Material" shall not be construed to be material in which moisture content is outside parameters established by these Specifications for acceptable foundation.
  6. The Contractor shall be entitled to no additional allowance above the unit prices in the bid schedule on account of the requirement for allowing additional time for drying; for stockpiling and re-handling excavated materials which have been deposited temporarily in stockpiles; delays or increased costs due to stockpiling; poor trafficability on the excavated areas, the haul roads, or the embankment; reduced efficiency of the equipment the Contractor elects to use; or on account of any other operations or difficulties caused by overly wet materials. No additional allowance above the unit prices bid in the schedule will be made because of variation in the proportions of wet and dry materials which are required to be excavated in order to obtain adequate suitable material.
  7. Refill at top of Concrete Lining

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- a. The Contractor will be permitted to over excavate at the top of the canal lining, as shown on drawings if needed, to accommodate lining equipment. Refill shall be placed as shown on the drawings. The material used for the refill may be obtained from required excavation. The type of material used, and the manner of depositing shall be subject to approval. Refill shall be placed, moistened, and compacted according to these specification for canal embankment fill. The refill shall be finished uniformly and neatly to the lines shown on the drawings.
  - b. All excess refill material which remains on the concrete lining or in the invert shall be completely removed including hand broom clean up.
8. The Contractor and Owner's Representative shall inspect all excavated canal embankments for presence of non-native or sandy soils.
- a. Repairs to the existing canal banks were typically done with non-native material with a significant percentage of coarse aggregate.
  - b. Non-native material and sandy material found within the canal embankments shall be removed to a depth of 12 inches below the non-native or sandy soil layer, or 2 feet below the canal invert, whichever is less, and replaced with suitable material.
  - c. Non-native material and sandy material found within the canal embankments could be blended to be considered suitable or could be considered unsuitable by the Owner's Representative. The use of the non-native material, or sandy material, or both within the earthwork shall be at the discretion of the Owner's Representative.
  - d. The Owner's Representative will work closely with the Contractor in the field to quantify for payment purposes the in-place volume of the unsuitable material that is required to be excavated and off-hauled.
9. Roads and Ramps
- a. In conjunction with construction of canal embankments, construct access roads and earth ramps adjacent to the canal and structures. Place material from excavations as embankments for the roads and ramps.
  - b. Where the width of a road is not shown in the Drawings it shall have width of not less than 14 feet. The work required for construction of access roads and for earth ramps shall include grading to a uniform surface equivalent to that obtainable with a motor grader to provide for safe travel with a two-wheel-drive automobile.

**3.6 ENGINEERED FILL AND EMBANKMENT CONSTRUCTION**

- A. Cut out soft areas of subgrade beneath roadways not readily capable of in-situ compaction. Backfill with Type A or Type B material per State Standard

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- Specifications Section 19-3.02C and compact to density equal to requirements for subsequent backfill material.
- B. Unless otherwise noted, placement and compaction of engineered fill materials for all fill areas shall be performed according to the provisions of the State Standard Specifications, Section 19-6. Section 19-6.02A shall be amended to say that large rocky material or hard lumps larger than three inches in greatest dimension will not be allowed.
- C. Before placing embankment, scarify ground surface to a depth of 12 inches below the original ground surface to provide ample bond between old and new material, as shown on the Plans. Place embankment material in layers not exceeding eight inches, loose measurement.
- D. When necessary, compact subgrade surfaces to density requirements for roadway embankment backfill material.
- E. Where compacting of earth materials is required, the materials shall be deposited in horizontal layers not more than eight inches thick. Compact each layer before placing the next layer. As the compaction of each layer progresses, continually level and manipulate to ensure uniform moisture and density. Add water to obtain optimum moisture content. Removal of excess water shall be accomplished through aeration by plowing, blading, disking, or other methods satisfactory to the Engineer. The excavation, placing, moistening, and compacting operations shall be such that the material will be uniformly compacted and will be homogeneous, free from lenses, pockets, streaks, voids, and laminations or other imperfections such that the materials when compacted will be blended sufficiently to secure the at least the required density.
- F. Moisture Content for Clayey and Silty (Cohesive) Materials:
1. Prior to and during compaction operations, the materials shall have an above optimum moisture content, but not greater than three percentage points of optimum moisture content, and the moisture content shall be uniform throughout each layer. The optimum moisture content is defined as that moisture content which will result in the laboratory maximum dry density of the soil as determined using ASTM D1557.
  2. If the moisture content is less than optimum for compaction, or is greater than optimum for compaction by more than three percentage points, the compaction operations shall not proceed, except with the specific approval of the Engineer, until the material has been wetted or allowed to dry out, as may be required, to obtain a moisture content within the tolerances permitted above, and no adjustment in price will be made on account of any operations of the Contractor in wetting or drying the materials or on account of any delays occasioned thereby.
- G. Moisture Content for Cohesionless Free-draining Materials: Prior to and during compaction operations, the materials shall have a moisture content at least equal to the optimum moisture content and shall be uniform throughout each layer. The

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optimum moisture content is defined as that moisture content which will result in the laboratory maximum dry density of the soil as determined using ASTM D1557.

- H. When the material has been conditioned as specified, it shall be compacted by rollers, by hand or power tampers.
- J. Fill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, or spongy subgrade surfaces.
- K. Employ a placement method that will not disturb or damage underground facilities.

**3.7 UTILITY INSTALLATION**

- A. Install utility marking as specified in section 33 05 26 - Utility Line Marking.
- B. Utility Installation shall be according the Division 33 Utilities. If not otherwise specified shape the trench bottom to ensure uniform contact with the full length of the installed line and remove any sharp-edged materials that might damage the line. Compaction shall be maintained beneath the line.

**3.8 SAND CEMENT SLURRY, CONCRETE ENCASEMENT AND THRUST BLOCKS**

- A. Concrete
  - 1. Place as shown on the Plans and in accordance with Section 03 30 30 Cast-In-Place Concrete (Site Concrete).
- B. Slurry Cement
  - 1. Slurry Cement is also referred to as Controlled Low Strength Material (CLSM).
  - 2. Place as shown on the plans and in accordance with State Standard Specifications, Section 19-3.03F.

**3.9 CONTROL OF WATER**

- A. The contractor shall keep all excavation free from water. Furnish, install, maintain, and operate all necessary pumping and other equipment for dewatering of excavations. The contractor shall at all times have on the project sufficient pumping equipment for immediate use, including stand by pumps for use in case other pumps become inoperable.
- B. The dewatering operation shall be continuous, so that the excavated areas are kept free from water during the construction, until backfill has been placed to a sufficient height to anchor the work against possible floatation.
- C. Dewatering devices shall be adequately filtered to prevent the removal of fines from the soil.

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- D. Repair any damage caused by the failure of any part of the protective works. Remove temporary protective works when they are no longer needed for dewatering purposes.
- E. Any drain rock required in the trench bottom to convey water or stabilize wet soil shall be included at no extra cost to the owner.
- F. Provision of dewatering and dewatering equipment shall be considered part of the project with no additional compensation allowed.

*3.10 SURPLUS MATERIAL*

- A. Unless otherwise specified, surplus suitable excavated material shall be used to widen embankments uniformly or to flatten slopes, or it shall be disposed of in a uniform manner in designated surplus material areas.
- B. Unless otherwise specified, surplus suitable excavated material shall be used as fill for other areas requiring fill as shown on the Plans. Excess material that is not needed for engineered fill may be disposed of at an off-site spoil area. The location of the off-site spoil area, the limits of the fill area, the depths of fill, and the manner of work shall be as directed by the Engineer.
- C. Stockpile all suitable surplus material as shown on the plans and/or as directed by the Engineer. Leave topsoil stockpiles in a level graded surface. All remaining native material stockpiles with unsuitable soils shall be disposed of offsite.
- D. Surplus native and other backfill materials may remain on site in a manner and location approved by the Owner.
- E. All surplus material shall be exported from the site.

*3.11 OFF-SITE BORROW AREAS*

- A. Engineered fill material may be obtained from off-site borrow areas if on-site sources prove to be insufficient.

*3.12 SHORING AND SHEETING*

- A. Construct and maintain all shoring, sheeting, and slope layback necessary to protect the excavation, as needed, for the safety of the employees and as required by applicable State and Federal laws. Provide suitable barricades for public safety, regardless of excavation depth.

*3.13 COORDINATION WITH OWNER'S REPRESENTATIVE ON ROCK REMOVAL*

- A. For purposes of payment, Contractor shall notify the Owner's representative of the start and completion of all rock removal work to allow measurement of quantities.

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**3.14 UNSUITABLE MATERIAL**

- A. Unsuitable material shall be excavated and disposed of in a lawful manner off the project site in accordance with Section 31 23 35 - Disposal of Materials. All disposal shall be approved by the Engineer prior to initiating the work.

**3.15 IN-PLACE DENSITY TESTING:**

- A. Compacted backfill for structures and structure foundations: At least one test per lift per 1,000 sf of surface area or per 500 cubic yards placed, whichever is more frequent.
- B. Subgrade preparation including scarification and re-compaction of native soils: At least 1 test per lift per 1,000 sf of surface area or 500 cubic yards of fill placed, whichever is more frequent.
- C. Embankments and building pads: At least 1 test per lift per 1,000 sf of surface area or every 200 lineal foot of embankment, or 2,000 cubic yards of fill placed, whichever is more frequent.
- D. A greater frequency of testing may be required at the start of work or when new materials, crews, or equipment are introduced to the site. A lesser frequency can be utilized if approved by the Owner's Representative.

**E. LABORATORY INDEX TESTING:**

- 1. Compacted backfill for structures, structure foundations: Maximum dry density and optimum moisture content, Plasticity Index, and Gradation (when applicable) shall be confirmed at least once for every structure and every 2,500 cubic yards of fill placed.
- 2. In addition, at least one set of applicable index tests shall be performed for each distinct material type used as compacted fill at the site.
- 3. Additional tests may be performed, as directed by the Owner's Representative, whenever deviations in material properties or quality of workmanship are suspected.
- 4. Where compaction tests indicate failure to meet the specified compaction, the Contractor will rework the entire failed area until the specified compaction has been achieved at no cost to the owner.

**3.16 SURFACE FINISH WORK**

- A. Open Areas: Grade all disturbed areas, blending with adjacent terrain without a noticeable break. Bring all sub-grades to specified contours, even and properly compacted.
- B. Paved Areas: Grade subgrade to produce a reasonably uniform surface.
- C. Drainage Ditches: Restore drainage ditches to appropriate line and grade, using approved surface erosion prevention techniques.

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- D. Clean Up: Remove all rubbish and excess material for disposal as approved, and leave area in a neat, satisfactory condition.

3.17 TOLERANCES

- A. Tolerances are defined as allowable variations from specified lines, grades, and dimensions. The intent of this paragraph is to establish tolerances that are consistent with modern construction practice yet are governed by the effect that permissible variations may have upon the construction.
- B. Variations from specified lines, grades, and dimensions:

Finish Grading Tolerance:	±0.10 foot
When flatwork, pavement or structures are to be placed directly on compacted subgrade, or with only a sand leveling course, the grading plane of the subgrade at any point shall not vary more than	±0.05 foot
When aggregate base material is to be placed on the subgrade, the grading plane of the subgrade at any point shall not vary more than	±0.05 foot
[Variation in elevation for invert of canal	±0.10 foot
Variation from specified width of section at any height	±0.25 foot
Departure from established alignment on tangents along the canal	0.30 foot
Departure from established alignment on curves along the canal	0.50 foot

Plus or minus variations indicate an allowable actual position up or down and in or out from the specified position in the drawings. Variations not designated as plus or minus indicate the maximum deviation permitted between designated successive points on the completed element of construction.

**END SECTION**

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COMMON WORK RESULTS FOR EARTHWORK  
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**SECTION 31 11 00**  
**CLEARING AND GRUBBING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of clearing, grubbing, grinding, transporting, removing and disposing of unsuitable material, trees, stumps, roots, vegetation debris, and existing improvements, including utilities, and other protruding obstructions within the clearing limits.
- B. Protect trees, landscaping and shrubs that are not designated to be removed or near construction site that may be harmed by construction activities.

*1.2 RELATED WORK*

- A. Section 01 56 16 – Dust Control
- B. Section 01 57 13 – Erosion Control
- C. Section 01 57 23 – Storm Water Pollution Prevention Plan
- D. Section 02 41 00 – Demolition
- E. Section 31 05 00 – Common Work Results for Earthwork

*1.3 REGULATORY REQUIREMENTS*

- A. Obtain all required permits.
- B. Dispose of removed materials in a legal manner at an approved disposal facility.
- C. One hundred percent of trees, stumps, rocks and associated vegetation and soils resulting from land clearing shall be reused or recycled.

*1.4 REFERENCES*

- A. Section 15 – Existing Facilities, State Standard Specifications
- B. Section 19 – Earthwork, State Standard Specifications

*1.5 DEFINITION*

- A. Unsuitable Material: Unsuitable material is material determined to be:
  - 1. Impossible to compact to specified density using ordinary methods at optimum moisture content.
  - 2. Material containing trash, debris, oversized material or other foreign and objectionable materials.

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3. Incapable of being compacted to Specified density using ordinary methods at optimum moisture content.
4. Too wet to be properly compacted if circumstances prevent satisfactory in-place drying prior to incorporation into the work.
5. Non-native material containing a significant amount of permeable materials, such as sand or rock, that cannot be blended with other material and requires to be off hauled.
6. Expansive clays that cannot be mixed or treated and requires to be off hauled.
7. Otherwise unsuitable for the planned use.

**PART 2 PRODUCTS**

*2.1 NOT USED*

**PART 3 EXECUTION**

*3.1 CLEARING AND GRUBBING*

- A. Clear the specified areas by removing, above the natural ground surface, all existing improvements including curbs, gutters, catch basins, storm drains, landscaping fencing and utilities; vegetable growth such as trees, shrubs, logs, upturned stumps, roots of down trees, brush, and similar material.
  1. Trees of 4-inch diameter and larger shall not be removed without Owner's authorization.
- B. Grub the specified areas below the natural ground surface, except in embankment areas where the grading plane is two feet or more above the natural ground, to a depth necessary to remove all boulders, stumps, roots, buried logs, and other objectionable material including rock and concrete. Remove and stock pile the top 4 inches of topsoil in any area which is to receive structural fill.

*3.2 PRESERVATION*

- A. If indicated or required, preserve trees, plants, rock outcroppings, or other features designated to remain. Protect trees and plants from damage; fell trees in a manner which shall not injure standing trees, plants and improvements which are to be preserved.

**END SECTION**

CLEARING AND GRUBBING  
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**SECTION 31 23 17**  
**TRENCHING, BACKFILLING AND COMPACTING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. This section includes material, testing, installation, and other requirements for trench excavation, bedding, backfilling and compacting for underground pipelines and utilities. Requirements in this section do not apply to underground landscape irrigation pipes. The words pipe, utility, and pipelines are interchangeable in this Section and apply to that which is being installed in the trench.

*1.2 RELATED WORK*

- A. Section 01 33 00 – Submittal Procedures
- B. Section 01 43 00 – Quality Control and Testing
- C. Section 03 30 00 – Cast-in-Place Concrete
- D. Section 31 05 00 – Common Work Results for Earthwork
- E. Section 31 11 00 – Clearing and Grubbing
- F. Section 31 23 19 – Dewatering
- G. Section 32 11 23 – Aggregate Base
- H. Division 33 - Utilities
- I. Section 40 05 00 – Pipe and Fittings

*1.3 REFERENCES*

- A. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- B. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup> (2,700 kN-m/m<sup>3</sup>).
- C. ASTM D1556 – Density of Soil and Base Rock in Place by Sand-Cone Method.
- D. ASTM D6938 – Density of Soil and Base Rock in Place by Nuclear method.
- E. ASTM D2937 – Density of Soil In Place by Tube method
- F. Cal/OSHA Construction Safety Orders, California Code of Regulations, Chapter 4, Subchapter 4.
- G. State Standard Specifications, Section 19 – Earthwork

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- H. State Standard Specifications, Section 26 – Aggregate Bases
- I. ASTM D2321 Installation of Underground Thermoplastic Gravity Pipelines
- J. AWWA Manual M23 PVC Pipe Design and Installation
- K. AWWA Manual M55 PE Pipe Design and Installation
- L. AWWA Manual M11 Steel Pipe: A Guide for Design and Installation
- M. American Concrete Pipe Association Concrete Pipe & Box Culvert Installation Guide
- N. Ductile Iron Pipe Research Association Installation Guide for Ductile Iron Pipe
- O. PVC Pipe Association Installation Guide for Gasket-Joint PVC Pressure Pipe
- P. National Resource Conservation Service (NRCS) Construction Specification 430 Irrigation Pipeline
- Q. NRCS Construction Specification Plastic (PVC,PE) Pipe
- R. U.S. Bureau of Reclamation Method for Prediction of Flexible Pipe Deflection M-25
- S. U.S Department of Labor, 29 CFR, 1926, Subpart P
- T. National Corrugated Steel Pipe Association (NCSPA) Corrugated Steel Pipe Design Manual
- U. NCSPA Installation Manual for Corrugated Steel Pipe and Structural Plate
- V. Advanced Drainage Systems Corrugated Plastic Pipe Storm Installation Guide

1.4 *SUBMITTALS*

- A. Submit plans as required for worker protection against caving ground in excavations. Submittals shall be in accordance with Section 01 33 00 – Submittal Procedures.
- B. Submit material classification and geotechnical test results on proposed imported fill.

1.5 *SAMPLES*

- A. Submit samples under provisions of Section 01 43 00 – Quality Control and Testing.

1.6 *PROTECTION*

- A. Prevent trench cave-in by sloping and/or shoring according to requirements of Cal/OSHA, the U.S. Department of Labor, and the Contract Documents.
- B. Notify Engineer of unexpected subsurface conditions.
- C. Protect bottom of trench from frost.

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- D. When pipe laying is not in progress, close the open ends of pipe. Do not allow trench water, animals or foreign material to enter the pipe.

1.7 *QUALITY ASSURANCE*

- A. Compaction Testing:
  - 1. All compaction testing shall be in accordance with Section 01 43 00 – Quality Control and Testing.

1.8 *CONTROL AND DIVERSION OF WATER*

- A. General – The Contractor shall furnish or procure all materials and labor required for constructing and maintaining all necessary cofferdams, channels, flumes, drains, sumps, and/or other temporary diversion and protective works and shall furnish, install, maintain, and operate all necessary pumping and other equipment for removal of water from the various parts of the work and for maintaining the trenches and other parts of the work free from water. The Contractor shall at all times have on the project sufficient pumping equipment for immediate use, including stand-by pumps for use in case other pumps become inoperable.
- B. Plan – Prior to beginning any work on the removal of water from trenches, the Contractor shall submit for the Engineer's approval a water control plan showing the proposed method for the removal of water from trenches and other parts of the work.
- C. Dispose of the water in a manner that will prevent damage to the adjacent property and in accordance with regulatory requirements.
- D. Provide separate pipelines to drain trench water during construction.
- E. Provide filters on devices to control and divert water to prevent the removal of fines from the soil.
- F. Repair any damage caused by the failure of any part of equipment to control and divert water. Remove temporary equipment to control and divert water when no longer needed for dewatering purposes.
- G. Provision of equipment to control and divert water shall be considered part of the project with no additional compensation allowed.

1.9 *PROJECT CONDITIONS*

- A. Existing underground utilities may exist at this site. Contractor shall take all necessary precautions to protect said utilities. Notify Engineer of any deviation in utility location from that which is shown on the drawings.
- B. Obtain all required permits and licenses before installing utilities and follow the rules and requirements of authorities having jurisdiction.
- C. Arrange construction sequences to provide the shortest practical time that the trenches will be open to avoid hazard to the public, and to reduce the possibility of trench collapse.

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*1.10 DEFINITION*

- A. Percent Compaction: The ratio of the field-tested dry density of earthfill to the maximum dry density determined in the laboratory according to the above-referenced Laboratory compaction test method – expressed as a percentage
- B. Unsuitable Material – Unsuitable material is material determined to be:
  - 1. Does not meet the material property requirements for engineered fill in the geotechnical engineering report and Specification Section 31 05 00 Common Work Results for Earthwork.
  - 2. Material containing trash, debris, oversized material or other foreign and objectionable materials.
- C. Deflection is the decrease of the vertical diameter of the pipe (and corresponding increase in horizontal diameter) due to load on the pipe. Deflection is expressed in terms of percentage as follows: change in diameter/ diameter x 100).
- D. Ovality% =  $2 \times [(D_{max}-D_{min})/(D_{max} +D_{min})] \times 100$  where Dmax and Dmin are maximum and minimum pipe diameters in any direction.

*1.11 CLASSIFICATION AND CHARACTERIZATION OF EXCAVATED MATERIAL*

- A. The Contractor shall consider all trenched material as being unclassified.

**PART 2 PRODUCTS**

*2.1 EXISTING GROUND AND BACKFILL*

- A. Existing Ground: In-situ soil or bedrock that the Contractor excavates for trenches. The Contractor may use this excavated material as backfill if it meets backfill material property requirements and/or if they process it so that it meets those requirements.
- B. Backfill: Soil fill that the Contractor places and compacts in trenches over granular backfill and aggregates and that meets material property requirements of the geotechnical engineering report and the Contract Documents. Backfill may consist of existing ground or imported earth material. The Engineer shall approve backfill before it is imported to the site and placed.

*2.2 AGGREGATES*

- A. Granular Backfill: material meeting the requirements of State Standard Specifications Section 19-3.02C.
- B. Gravel: Natural rock; free of shale, clay, friable materials and debris; graded in accordance with 1½" x ¾" aggregate grading in Section 90-1.02C, State Standard Specifications.

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- C. Pea Gravel: Natural rock aggregate; washed, free of clay, shale, organic matter; No. 8 minimum to 3/8" maximum size per State Standard Specifications Section 90-102C(4)(a).
- D. Sand: Natural sand; free of friable or soluble materials, less than 2 percent organics by dry weight, and graded in accordance with State Standard Specifications Section 90-1.02C(4)(c):

2.3 CONCRETE SLURRY

- A. Concrete slurry mix shall be as specified in Section 03 30 00 - Cast-in-Place Concrete.

2.4 MATERIALS FOR TRENCH BACKFILLING

- A. Furnish required bedding, select backfill, and backfill materials shown on the Plans and that meets requirements in this section depending on the trench type.
- B. The Engineer shall approve all trench-backfill material prior to the Contractor's import and placement.
- C. Materials used in backfill, as shown in trench details, are defined as follows:

1. Bedding: Where trench bottoms expose bedrock and/or soil with hard gravel/cobble particles that protrude up into the excavation, and when trench subgrades consist of soft and unstable soil, then bedding is required. Bedding may be omitted if, in the opinion of the Engineer, the excavated trench bottom will adequately support and not damage the utility line. Material property requirements for bedding follow:

- a. Less than 2 percent of organics by dry weight
- b. Plasticity index of less than 6
- c. The following particle size distribution:

<u>Sieve Size</u>	<u>Percent Passing by Dry Weight</u>
½ inch	100
No. 4	50-80
No. 200	10-25

- d. Sand Equivalent of 30, per ASTM D2419.

2. Select Backfill: Select Backfill may be required as shown on the Plans. Select backfill shall meet the material property requirements in the Geotechnical Engineering report and the material property requirements that follow:

- a. Less than 2 percent by dry weight of organics
- b. Plasticity index of less than 6
- c. The following particle size distribution:

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<u>Sieve Size</u>	<u>Percent Passing by Dry Weight</u>
½ inch	100
No. 4	50-80
No. 200	10-25

3. Backfill: Backfill shall meet the material property requirements in the Geotechnical Engineering report and the material property requirements that follow:
  - a. Less than 2 percent by dry weight of organics
  - b. Plasticity index of less than 16
  - c. The following particle size distribution:

<u>Sieve Size</u>	<u>Percent Passing by Dry Weight</u>
8-inch	100
4-inch	90
¾-inch	70
No. 4	60

4. Gravel: Gravel shall meet the requirements listed above under Aggregates.
5. Pea Gravel: Pea gravel shall meet the requirements listed above under Aggregates
6. Sand: Sand shall meet the requirements listed above under Aggregates.

**2.5 SAND-CEMENT SLURRY**

- A. Sand-cement slurry backfill shall be as specified in Section 03 30 00 – Cast-in-Place Concrete.

**2.6 WATER FOR FILL MOISTURE CONDITIONING AND COMPACTION**

- A. Water shall be free of organic materials injurious to the pipe coatings, have a pH of 7.0 to 9.3, maximum chloride concentration of 500 mg/l, and a maximum sulfate concentration of 500 mg/l.

**PART 3 EXECUTION**

**3.1 GENERAL**

- A. Excavation shall be by open cut except that short sections of a trench may be tunneled if the utilities can be safely and properly installed and backfill can be properly compacted in such tunnel sections.



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3.2 *INSPECTIONS*

- A. The contractor must verify that the engineer has approved stockpiled material for reuse as backfill material (for each backfill zone for intended use).
- B. The contractor shall verify that trenches that they will backfill are free of debris, snow, ice, or water, and that ground surfaces that backfill will cover are not frozen.

3.3 *PREPARATION*

- A. Identify required lines, levels, contours, and datum.

3.4 *AC PAVEMENT AND CONCRETE REMOVAL*

- A. Cut bituminous and concrete pavements, regardless of the thickness, curbs, gutters and sidewalks prior to excavation of trenches.
  - 1. The contractor shall saw cut existing pavement at least one lateral foot beyond (outside of) the trench edges or further out as shown on the Plans.
  - 2. The contractor shall remove all pavement and aggregate within the saw cuts.
  - 3. AC pavement and concrete rubble shall not be used for trench backfill.
  - 4. The contractor shall replace aggregate and pavement surfaces according to Specification Section 32 12 16 Asphalt Concrete Paving.

3.5 *TRENCH EXCAVATION*

- A. Excavate the trench to the lines and grades shown on the Plans with allowance for pipe thickness, sheeting, shoring, and bedding.
- B. Trenching Guidelines: Excavate the trench to the approximate level of the grade of the utility line to be installed, using adequate trench width and side slopes to safely accommodate worker access.
  - 1. Rocky Trench Bottom: Where ledge rock, hard pan, boulders, or sharp-edged materials are encountered, over excavate trenches at least 6 inches below and beyond the planned excavation lines. The installed utility shall have at least 6 inches of clearance from any rock protrusion.
  - 2. Unstable Trench Bottom: Secure the Engineer's approval of over-excavation depth and stabilization method. The Contractor must seek the Engineer's approval of overexcavation bottoms and subgrades before the Contractor backfills and places utility pipes/conduits.
  - 3. Wet Trench Construction: use approved method of dewatering through diversion, damming and pumping, well points, or underdrain systems. Dispose removed fluidized materials as approved. Use bedding material to build a suitable foundation to within 6 inches of finished utility grade, prior to bedding with the specified material. Place and compact backfill as specified.

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The Contractor must seek the Engineer's approval of overexcavation bottoms and subgrades before the Contractor backfills and places utility pipes/conduits.

- C. Correct unauthorized excavation at no cost to Owner.
  - 1. If the trench is excavated below the required grade, backfill over-excavations with compacted engineered backfill as specified.
- D. Trench widths shall be as shown on the Plans. If no details are shown, then the maximum width in the pipe zone shall be 24 inches greater than the pipe outside diameter.
- E. Trench width at the top of the trench will not be limited except where width of excavation would undercut adjacent structures and footings. In such case, width of trench shall be such that there is at least two feet between the top edge of the trench and the structure or footing.
- F. Excavation shall not interfere with normal 45 degree bearing splay of foundations.
- G. Hand trim for bell and spigot pipe joints.
- H. During trench excavation, place the excavated material only within the working area. Do not obstruct roadways or streets. Follow Caltrans guidelines for excavation safety for conditions of surcharge from stockpiled material.

3.6 *LENGTH OF OPEN TRENCH*

- A. Limit the length of open trench to 300 feet in advance of pipe laying or amount of pipe installed in one working day.
- B. Complete backfilling, temporary or first layer paving, not more than 400 feet in the rear of pipe laying operation.

3.7 *TRENCH EXCAVATION IN EMBANKMENT AREAS*

- A. Construct and compact fill embankments to an elevation one foot, minimum, over the top of the largest pipe or conduit to be installed prior to trench excavation.

3.8 *UNSUITABLE MATERIAL*

- A. Unsuitable material shall be excavated and disposed of in a lawful manner off the project site, all disposal shall be approved by the Engineer prior to initiating the work.

3.9 *CONTROL OF WATER*

- A. The Contractor shall keep trenches free from water, maintain and operate all necessary pumping and other equipment for dewatering of excavations.
- B. The dewatering operation shall be continuous, so that the excavated areas are kept free from water during the construction.

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- C. Do not drain trench water through pipeline under construction but use separately provided pipeline.
- D. Repair any damage caused by the failure of any part of the protective works. Remove temporary protective works when they are no longer needed for dewatering purposes.
- E. Use of any drain rock in the trench bottom to convey water or stabilize wet soil shall only be done if approved by the Engineer.

3.10 TRENCH BACKFILLING

- A. Support pipe during placement and compaction of bedding fill.
- B. Backfilling and cleanup work shall be accomplished as sections of pipe or conduit are tested and approved.
- C. Sections 01 55 26 Traffic Control Plan and 01 57 56 Traffic Control govern vehicular travel through the work site
- D. Compaction: The contractor shall choose means and methods for achieving compaction. Generally, vibratory compactors tend to work better for sands and gravels (non-cohesive soils) and mechanical tampers work better for sand and gravel containing a significant portion of fine-grained materials, such as silt and clay (cohesive soils).
- E. Hand tamp around pipe or cable to protect the lines until adequate cushion is attained. Puddling or water flooding for consolidation of backfill or compaction by wheel rolling will not be permitted.
- F. Bedding: Unless otherwise specified, compact the specified material to 95 percent of maximum density to the finished utility grade.
- G. Embedment: Fill by hand placement around the utility to just over half depth, and compact in a manner to ensure against lateral or vertical displacement. Place select backfill to 12 inches above the utility line by hand placement in not more than 6-inch layers.
- H. Backfill: Soil backfill shall be placed and backfilled in lifts, with each lift compacted to the project requirements prior to addition of the next layer. Unless otherwise specified, place and compact the specified material as follows:
  - 1. Vehicular Traffic Areas: Fill and compact in 8-inch maximum loose lifts as follows:
    - a. From top of select backfill to two feet below top of subgrade, compact to 90 percent compaction.
    - b. From two feet below top of subgrade to top of subgrade, compact to 95 percent compaction.

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2. Non-traffic Areas: Fill and compact in 8-inch maximum layers to 90 percent compaction.
  - I. Employ a placement method that will not disturb or damage pipes or utilities.
  - J. Maintain moisture content of backfill materials to attain required compaction density.
  - K. Compact trench-backfill to the specified percent compaction. Compact by using mechanical compaction or hand tamping. Do not use high impact hammer type equipment except where the pipe manufacturer warrants in writing that such use will not damage the pipe. Do not use water flooding or jetting for backfill compaction.
  - L. Compact material placed within 12 inches of the outer surface of the pipe by hand tamping only.
    1. Carefully place the material around the pipe so that the pipe barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe.
    2. Use particular care in placing material on the underside of the pipe to prevent lateral movement during subsequent backfilling.
  - M. After pipe has been bedded, place pipe zone material simultaneously on both sides of the pipe, in maximum 8-inch lifts, keeping the level of backfill the same on each side.
  - N. Do not use any axle-driven or tractor-drawn compaction equipment within 5 feet of building walls, foundations, and other structures.
  - O. Do not permit free fall of the material until at least two feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe or on the surface of compacted backfill around the pipe. Do not operate heavy equipment over the pipe until at least 3 feet of backfill has been placed and compacted over the pipe.
  - P. Remove surplus backfill materials from site.
  - Q. Leave stockpile areas completely free of excess fill materials.

3.11 TESTING FREQUENCY

A. Backfill Compaction:

Pipeline Trenches: At least 1 test per lift per every 200 feet of trench backfill placed or every 500 cubic yards placed, whichever is more frequent.

A greater frequency of testing may be required at the start of work or when new materials, crews, or equipment are introduced to the site. A lesser frequency can be utilized if approved by the Engineer and the Owner's Representative.

B. Laboratory Index Testing:

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In addition, at least one set of index tests shall be performed for each distinct material type used as compacted fill at the site.

Additional tests may be performed, as directed by the Owner's Representative, whenever deviations in material properties or quality of workmanship are suspected.

3.12 TOLERANCES

- A. Top Surface of trench backfill: ±0.1 foot.

3.13 SAND CEMENT SLURRY, CONCRETE ENCASEMENT AND THRUST BLOCKS

- A. Place in accordance with the Contract drawings.

3.14 PIPE DEFLECTION AND OVALITY CONTROL

- A. Pipe installation and backfill process shall be done in a manner that does not overly deflect pipe or make it overly oval in any direction so that deflection or ovality limits in pipe specifications or installation guidelines are exceeded. The following table has common deflection and ovality limits for flexible pipes but pipe specifications and installation guidelines shall govern over this table. Owner has the option to hire a third-party testing firm to conduct pipe mandrel testing to verify the pipe installation is within the following requirements or as stated in the individual pipe specification sections.

Pipe Type	Deflection and Ovality Limit
PVC Pressure, Sewer, or Gravity Pipe	7.5%
Corrugated HDPE	12" and smaller 5%
	>12" to 30" 4%
	>30" to 60" 3%

**END SECTION**

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**SECTION 31 23 19  
DEWATERING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. This section includes designing, furnishing, installing, operating, maintaining, and removing a dewatering system. The system shall be of sufficient size and capacity to maintain a dry condition for construction of each part of the work without delaying construction operations. Control all water regardless of source. Comply with applicable environmental protection laws and requirements in operation of the dewatering system.

*1.2 RELATED WORK*

- A. Section 01 33 00 – Submittal Procedure
- B. Section 31 05 00 – Common Work Results for Earthwork
- C. Section 31 23 17 – Trenching, Backfilling and Compacting

*1.3 SUBMITTALS*

- A. Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
- B. Submit information on the proposed type of dewatering system including the arrangement, location and depths of system components.
- C. Complete description of equipment and instrumentation to be used with installation including operation and maintenance procedures.
- D. Type and sizes of desiltation equipment.
- E. Method of disposal of pumped water.

**PART 2 PRODUCTS**

Not used.

**PART 3 EXECUTION**

*3.1 GENERAL*

- A. Provide means and devices to remove promptly and dispose of water entering excavations and keep the bottoms of the excavations firm and free of standing water and side slopes stable until the pipeline or structures to be constructed are completed and/or the backfill to be placed therein has been placed.

DEWATERING  
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- B. Perform the pumping and dewatering operations such that no disturbance to the bearing soil or to soil supporting any other work will result from the dewatering operations. The dewatering discharge shall not cause siltation or other negative environmental impact on natural waterways or other property; such discharge shall be in accordance with applicable federal, state, and local regulations.
- C. Operate the dewatering system continuously to prevent flotation of partially completed pipelines, structures or other work and flooding/excess wetting of work areas.

3.2 *DEWATERING REQUIREMENTS*

- A. Design, furnish, install, maintain, and operate a dewatering system which shall prevent loss of fines, boiling, quick conditions, or softening of foundation strata and maintain stability of bottoms of excavations so that every phase of the work can be performed in the dry with the exception of dredging. Prior to placement of concrete or pipe the subgrade shall be in a firm, well drained condition and of adequate and uniform load bearing nature to support construction personnel, materials, equipment and reinforcing steel mats without tracking, rutting, heaving or settlement. All soft, saturated or otherwise unsuitable material shall be removed and replaced with approved backfill.
- B. Water levels shall be a minimum of 2 feet below subgrade until all backfill is placed and compacted.

3.3 *INSTALLATION AND OPERATION*

- A. The location of every element of the dewatering system shall be such that interference with excavation and construction activity is minimized.
- B. Demonstrate to the Owner's Representative that the dewatering system meets the specified requirements.
- C. When the dewatering system does not meet the specified requirements and, as a consequence, loosening or disturbance of the foundations strata, instability of the slopes, or damage to the foundations or structures occurs, provide materials, labor, and work for restoration of foundations soil, fill soils, slopes, foundations, or structures at no cost to the Owner.
- D. When the dewatering system does not meet the specified requirements and consequently fill surfaces become too wet or the fill exceeds the specified moisture content, remove and replace the upper materials with materials placed and compacted to the specifications. Do not dry out overly wet fills resulting from failed or inadequate dewatering systems or mix with dry material and rework in-place to meet applicable fill specifications.

3.4 *STANDBY EQUIPMENT*

- A. Provide standby pumping and power equipment of sufficient capacity to maintain the dewatering system in an operable condition in the event of failure of any of the original equipment or power.



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3.5 *DAMAGES*

- A. The Contractor shall be responsible for and shall repair without cost to the Owner any damage to work in place, other contractors' equipment, and the excavation, including damage to the bottom of the excavation due to heave and removal of material and pumping out of the excavated area that may result from the Contractor's negligence, inadequate or improper design and operation of the dewatering system, and any mechanical or electrical failure of the dewatering system.

3.6 *REMOVAL*

- A. Remove the components of the dewatering system from the site at the completion of the dewatering work.

**END SECTION**

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**SECTION 31 23 35**  
**DISPOSAL OF MATERIALS**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Disposal of unsuitable material, concrete, asphalt concrete, rubbish, and other debris, as described below.

*1.2 RELATED WORK*

- A. Section 01 57 23 – Storm Water Pollution Prevention Plan
- B. Section 01 57 27 – Dust Control
- C. Section 03 33 00 – Cast-In-Place Concrete
- D. Section 31 05 00 – Common Work Results for Earthwork
- E. Section 31 11 00 – Clearing and Grubbing
- F. Section 31 37 10– Riprap

*1.3 SUBMITTALS*

- A. Submittals shall be in accordance with Section 01 33 00 - Submittal Procedures.

*1.4 GENERAL*

- A. The Contractor shall be responsible for the cleanup and disposal of waste materials and rubbish. The disposal of waste materials and rubbish shall be in accordance with applicable Federal, State, and local laws and regulations, and with the requirements of this paragraph. Should a conflict exist in the requirements for cleanup and disposal of waste materials, the most stringent requirement shall apply.
- B. The Contractor shall keep records of the types and amounts of waste materials produced, and of the disposal of all waste materials on or off the jobsite.
- C. The cost of disposing of waste materials other than unsuitable materials shall be included in the prices bid in the schedule for other items of work.

**PART 2 PRODUCTS**

Not Used

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**PART 3 EXECUTION**

**3.1 DISPOSAL OF EXCAVATED MATERIAL**

- A. All excess excavated material shall be handled according to Section 31 05 00 – Common Work Results for Earthwork.
- B. All unsuitable material that is hauled off-site shall be properly disposed.
  - 1. The Contractor shall be allowed to reuse waste concrete as riprap, subject to the requirements stated in Section 31 37 10 – Riprap.

**3.2 DISPOSAL OF CONCRETE AND A.C. SURFACING**

- A. All concrete not reused as riprap, A.C. and pavement removed from the project site shall be disposed of at a site obtained by the Contractor and approved by the Owner's Representative. No recyclable material shall be disposed of at any landfill. All disposable recyclable materials shall be disposed in a manner that facilitates recycling. Payment for disposal, including all costs of hauling, shall be as specified in the Technical Specifications or Explanation of Bid Items. The Contractor shall report quantities of disposed material in a manner that enables the Owner to utilize diverted quantities as diversion credits pursuant to California Integrated Waste Management Act of 1989 (Public Resources Code Sections 40000 et seq.)

**3.3 DISPOSAL OF OTHER DEBRIS**

- A. All oil cake, wood debris, structure demolition, vegetation and any other debris removed from the project site shall be legally disposed of at a site(s) obtained by the Contractor with prior written permission of the Owner's Representative. Contractor shall identify the proposed Disposal Site(s) at the pre-construction conference. Such Disposal Site(s) shall be a properly licensed and permitted facility pursuant to state and local regulations for purposes of accepting delivery of the respective materials. No recyclable material shall be disposed of at any landfill. All disposable recyclable materials shall be disposed in a manner that facilitates recycling. In addition to the following, a certificate of compliance stating disposal location and manner of disposal of recyclable materials shall be submitted to the Owner's Representative.
  - 1. Disposal of combustible materials shall be by removal from the construction area. Disposal of combustible materials by burning will not be permitted. Disposal of waste materials by burying will not be permitted.
  - 2. Waste materials shall be disposed of or recycled at a State approved disposal or recycle facility. The Contractor shall make any necessary arrangements with private parties, and State and county officials pertinent to locations and regulations of such disposal or recycle facilities, and shall pay any fees or charges required for such disposition.

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**3.4 CONTRACTOR'S DISPOSAL SITES**

- A. Contractor shall make arrangements for disposing of the materials at the Disposal Site(s) and pay all costs involved. Arrangements shall include, but not be limited to, obtaining written authorization from the property owner of the Disposal Site(s) and before disposing of any material off the project site, Contractor shall furnish to the Owner's Representative the authorization or a certified copy thereof together with a written release from the property owner absolving the Owner from any and all responsibility in connection with the disposal of material on the property of the Disposal Site(s). Before any material is disposed of on the Disposal Site(s), the Contractor shall obtain written permission from the Owner's Representative to dispose of the material at the location designated in the authorization.
- B. It is expressly understood and agreed that the Owner assumes no responsibility to the Contractor whatsoever by the granting of such permission and Contractor shall assume all risks in connection with the use of the Disposal Site(s). The Contractor is cautioned to make such independent investigation and examination as the Contractor deems necessary to be satisfied as to the quantity and types of materials which may be disposed of on the Disposal Site(s) and the status of any permits or licenses in connection therewith.
- C. Within 24 hours of removing the respective material from the project site for disposal, Contractor shall provide Owner's Representative with a certified copy of the weight slip from the Disposal Site obtained by Contractor upon delivery of such debris, and a certified statement from Contractor identifying the material constituting the debris and that it was disposed of at the Disposal Site (identifying the and name of the owner) in accordance with all laws and applicable regulations promulgated by Federal, State, regional, or local administrative and regulatory agencies.

**3.5 DISPOSAL OF HAZARDOUS WASTE AND MATERIALS**

- A. Materials or wastes, defined as hazardous by 40 CFR 261.3, or by other Federal, State, or local laws or regulations, used by the Contractor or discovered in work or storage areas, shall be disposed of in accordance with these specifications and applicable Federal, State, and local laws and regulations. Unknown waste materials that may be hazardous shall be tested, and the test results shall be submitted to the Owner's Representative for review.
- B. Waste materials known or found to be hazardous shall be disposed of in approved treatment or disposal facilities. Hazardous wastes shall be recycled whenever possible. A copy of all hazardous waste manifest shall be sent to the Owner's Representative.
- C. Waste materials discovered at the construction site shall immediately be reported to the Owner's Representative. If the waste may be hazardous, the Owner's Representative may order delays in the time of performance or changes in the work, or both. If such delays or changes are ordered, an equitable adjustment will be made in the contract in accordance with the applicable clauses of the contract.
- D. If necessary, the Contractor will be required to conduct an environmental site assessment at the following Contractor use locations:

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1. All hazardous waste accumulation areas;
2. All hazardous material and petroleum dispensing and storage areas where the aggregate storage of hazardous materials or petroleum at the site is or has been over 110 gallons.
3. This site assessment shall be performed by a qualified environmental consultant or equivalent and shall document through appropriate analytical sampling that the site is free of the effects of contamination (i.e., contaminant concentrations less than State action cleanup levels).

3.6 *CLEANUP*

- A. The Contractor shall keep work and storage areas free from accumulations of waste materials and rubbish, and before completing the work, shall remove all plant facilities, buildings, including concrete footings and slabs, rubbish, unused materials, concrete forms, and other like materials, which are not a part of the permanent work.
- B. Upon completion of the work, and following removal of construction facilities and required cleanup, work areas shall be regraded and left in a neat manner conforming to the natural appearance of the landscape.

**END SECTION**

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## **SECTION 31 37 10 RIPRAP**

### **PART 1 GENERAL**

#### *WORK INCLUDED*

- A. The work of this section consists of furnishing and placing rock riprap for embankment and channel protection.

#### 1.2 *RELATED WORK*

- A. Section 31 05 00 – Common Work Results for Earthwork

#### 1.3 *REFERENCES*

- A. Section 72 – Slope Protection, State Standard Specifications.

#### 1.4 *SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Manufacturer's installation instructions for geotextile fabric.

### **PART 2 PRODUCTS**

#### 2.1 *GEOTEXTILE FABRIC*

- A. Non-woven drainage fabric, shall be Mirafi 140NC as manufactured by TenCate Geosynthetics, Pendergrass, GA 30567, or Engineer approved equivalent.
- B. Provide securing pins recommended by fabric manufacturer and fold back as shown on the drawings.

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2.2 RIPRAP

- A. Riprap shall be Class No 2 as specified in Section 72-2.02 of the State Standard Specifications.

**Rock Gradation**

Nominal RSP class by median particle diameter <sup>b</sup>		Nominal median particle weight W <sub>50</sub> <sup>c,d</sup>	d <sub>15</sub> <sup>c</sup> (inches)		d <sub>50</sub> <sup>c</sup> (inches)		d <sub>100</sub> <sup>c</sup> (inches)	Placement
Class <sup>a</sup>	Diameter (inches)		Min	Max	Min	Max	Max	Method
I	6	20 lb	3.7	5.2	5.7	6.9	12.0	B
II	9	60 lb	5.5	7.8	8.5	10.5	18.0	B
III	12	150 lb	7.3	10.5	11.5	14.0	24.0	B
IV	15	300 lb	9.2	13.0	14.5	17.5	30.0	B
V	18	1/4 ton	11.0	15.5	17.0	20.5	36.0	B
VI	21	3/8 ton	13.0	18.5	20.0	24.0	42.0	A or B
VII	24	1/2 ton	14.5	21.0	23.0	27.5	48.0	A or B
VIII	30	1 ton	18.5	26.0	28.5	34.5	48.0	A or B
IX	36	2 ton	22.0	31.5	34.0	41.5	52.8	A
X	42	3 ton	25.5	36.5	40.0	48.5	60.5	A
XI	46	4 ton	28.0	39.4	43.7	53.1	66.6	A

<sup>a</sup>For RSP Classes I–VIII, use Class 8 RSP fabric. For RSP Classes IX–XI, use Class 10 RSP fabric.

<sup>b</sup>Intermediate or B dimension (i.e., width) where A dimension is length and C dimension is thickness.

<sup>c</sup>d%, where % denotes the percentage of the total weight of the graded material.

<sup>d</sup>Values shown are based on the minimum and maximum particle diameters shown and an average specific gravity of 2.65. Weight will vary based on specific gravity of rock available for the project.

**PART 3 EXECUTION**

3.1 EXCAVATION

- A. Excavate as shown and as necessary to accept variation in stone size. Obtain Contracting Officer's approval of subgrade before placing geotextile fabric or riprap.

3.2 GEOTEXTILE FABRIC

- A. Place on smooth, uniform slope, loosely enough to conform to minor surface irregularities. Follow manufacturer's recommendations for making laps and for fastening and securing. Repair or replace fabric that has been damaged to stone placement. Re-lay fabric that becomes dislodged.

3.3 PLACEMENT

- A. Placement shall be Method B as specified in Section 72-2.03C of the State Standard Specifications

**END SECTION**



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**SECTION 32 11 23**  
**AGGREGATE BASE**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Furnish, spread, and compact aggregate base in roadways, driveways and other paved areas as shown on the Plans.
- B. The work of this section consists of furnishing and placing aggregate base material and/or lean concrete base materials, and filler if required, on the prepared subgrade.

*1.2 RELATED WORK*

- A. Section 31 05 00 – Common Work Results for Earthwork
- B. Section 32 12 13 – Bituminous Prime and Tack Coat
- C. Section 32 12 16 – Asphalt Concrete Paving

*1.3 REFERENCES*

- A. Section 10-6 – Watering, State Standard Specifications.
- B. Section 26 – Aggregate Bases, State Standard Specifications.
- C. Section 28-2 - Lean Concrete Base, State Standard Specifications.
- D. ANSI/ASTM C136 – Sieve Analysis of Fine and Coarse Aggregates.
- E. ANSI/ASTM D1557 – Moisture-Density Relations of Soils and Soil-Aggregate Mixture Using 10 lb (4.54 kg) Hammer and 18-inch (457 mm) Drop.
- F. ANSI/ASTM D1556 – Density of Soil and Base Rock in Place by Sand-Cone Method.
- G. ASTM D6938 – Density of Soil and Base Rock in Place by Nuclear Method.

*1.4 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. If materials are obtained from a commercial source, submit certification from the supplier certifying that aggregate base course meets the requirements of this section.
- C. Copies of certified weight tickets for each load of aggregate delivered to the project site.

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1.5 QUALITY ASSURANCE

A. Relative Compaction:

1. All costs for initial compaction tests shall be borne by the Owner. All areas that fail to meet the minimum compaction requirements shall be reworked as required by the Engineer and retested until minimum compaction requirements are obtained.
2. The cost of any retests, including time for the Engineer, shall be borne by the Contractor at no additional cost to the project. Testing will be required as directed by the Engineer. Test locations shall be determined by the Engineer upon notification from the Contractor that the grade is ready for tests. Contractor shall be present when samples of bedding, select backfill, and backfill materials are gathered for analysis or testing.

B. Compaction tests will be performed for each lift or layer.

C. Tests for compaction shall conform to references listed in Part 1.3 of this section.

D. Sample backfill materials per ASTM D75.

E. Compaction testing will be performed in accordance with Section 19-5 of the State Standard Specifications.

1. Compaction testing of areas to be saw cut and replaced shall be one for every 300-LF of adjacent curb and gutter but not less than one for each curb cut area.
2. The Contractor shall not proceed with work over the area being tested until results have been verified by the Engineer. Immediately upon completion of each compaction test, a copy of the results shall be given by the testing laboratory to the Engineer.

F. The percentage composition by weight shall conform to Class 2 aggregate base determined by Test Method No. Calif. 202, modified by Test Method No. Calif. 905 if there is a difference in specific gravity of 0.2 or more between the coarse and fine portion of the aggregate or between blends of different aggregates.

G. Aggregate base shall also conform to the following quality requirements:

<u>Tests</u>	<u>Test Method Calif. No</u>
R-Value	301
Sand Equivalent	217
Durability Index	229

H. Quality Control shall be under the provisions of Section 01 43 00 – Quality Control.

AGGREGATE BASE  
32 11 23-2

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**PART 2 PRODUCTS**

**2.1 MATERIALS**

**A. AGGREGATE BASE**

1. Class 2 Aggregate Base,  $\frac{3}{4}$ -inch maximum; as per Section 26-1.02B, State Standard Specifications.
2. Crushed Portland cement concrete which meets the gradation requirements of State Standard Specification Section 26, Class 2 Aggregate Base,  $\frac{3}{4}$ -inch maximum, may be used as aggregate base course under new pavements.
3. Aggregate for Class 2 aggregate base shall be free from organic material and other deleterious substances.

**B. AGGREGATE SUBBASE**

1. Class 2 Aggregate subbase; as per Section 25-1.02B, State Standard Specifications.
2. Crushed Portland cement concrete which meets the gradation requirements of State Standard Specification Section 25, Class 2 Aggregate Subbase may be used as aggregate subbase course under new pavements.
3. Aggregate for Class 2 aggregate subbase shall be free from organic material and other deleterious substances.

**C. LEAN CONCRETE BASE**

1. Lean Concrete Base shall conform to the State Standard Specifications, Section 28-4, Lean Concrete Base Rapid Setting.
2. State Standard Specifications Section 28-4.04 shall not apply.

**D. WATER**

1. As specified in Section 01 51 36, Watering.
2. At the time aggregate base is spread, it shall have a moisture content sufficient to obtain the required compaction. Such moisture shall be uniformly distributed throughout the materials.

**PART 3 EXECUTION**

**3.1 SUBGRADE PREPARATION**

- A. As specified in Sections 31 05 00, Common Work Results for Earthwork and 01 51 36, Watering.

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3.2 *SPREADING*

- A. The aggregate base course material shall be deposited and spread to the required compacted thickness by means that will maintain the uniformity of the mixture. The aggregate base course shall be free from pockets of coarse or fine material.
- B. Deliver aggregate base to the area to be paved as a uniform mixture and spread each layer in one operation.
- C. Aggregate base placed at locations which are inaccessible to the spreading equipment shall be spread in two layers by any means to obtain the specified results.
- D. The aggregate shall not be treated with lime, cement or other chemical materials before the Durability Index test has been performed.
- E. The surface of the finished aggregate base at any point shall not vary more than  $\pm 0.05$ -foot from the grade shown.

3.3 *PLACING*

- A. If the required compacted depth of the aggregate base course exceeds 6 inches, place course in two or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches.

3.4 *MIXING*

- A. Mixing shall be in accordance with one of the methods set forth in State Standard Specifications, Section 28-4.03B.

3.5 *MOISTURE CONTROL*

- A. When spread, aggregate base shall have a moisture content sufficient to obtain the specified compaction.

3.6 *SURFACE FINISHING*

- A. Use a smooth steel wheel roller for the final rolling of top surface base course. Water surface and evenly spread loose stones before final rolling. Make minimum of two complete passes over area to embed stones. Correct soft spots developed during rolling.
- B. Compacted aggregate base course surface shall be smooth and free from waves and other irregularities. Unsatisfactory portions of base course shall be corrected, at no additional expense to the Owner.

3.7 *MATERIAL ACCEPTANCE REQUIREMENTS*

- A. Acceptance will be based on periodic samples and tests taken following mixing and before placing.

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**3.8 TOLERANCES**

- A. Surface: The finished surface of the base course will be tested with a 10-foot straightedge or other device. The variation between any two contacts with the surface shall not exceed  $\pm 0.05$  feet.
- B. Width: Plan dimension,  $\pm 0.10$  feet.
- C. Thickness: Plan dimension,  $\pm 0.05$  feet.
- D. Any areas not complying with these tolerances shall be reworked to obtain conformity, at no additional expense to the Owner.

**3.9 MAINTENANCE**

- A. Maintain base course in a satisfactory condition until surfaced or until final acceptance.

**END SECTION**

AGGREGATE BASE  
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AGGREGATE BASE  
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**SECTION 32 12 13**  
**BITUMINOUS PRIME COAT AND TACK COAT**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Prime Coat work consists of applying an application of asphalt or asphalt cutback, as specified, to the complete and compacted aggregate base course prior to placement of hot mix asphalt concrete.
- B. Tack Coat work consists of an application of asphalt cutback between asphalt layers. Applying a very light application of asphalt emulsion diluted with water as a tack between asphalt layers to create an adhesive surface for new asphalt concrete pavement to adhere to, and applied to all existing vertical surfaces where new pavement is to be surfaced.

*1.2 RELATED WORK*

- A. Section 31 05 00 – Common Work Results for Earthwork
- B. Section 32 11 23 – Aggregate Base
- C. Section 32 12 16 – Asphalt Concrete Paving

*1.3 REFERENCES*

- A. Section 37 – Seal Coats, State Standard Specifications
- B. Section 39 – Asphalt Concrete, State Standard Specifications
- C. Section 92 – Asphalt Binder, State Standard Specifications
- D. Section 94 – Asphaltic Emulsions, State Standard Specifications

*1.4 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Certificate of compliance for asphalt binder or asphaltic emulsion in accordance with Section 94 of State Standard Specifications

*1.5 PROJECT CONDITIONS*

- A. Apply bituminous material only during daylight hours, when surface is dry, temperature is above 50°F, and weather is not foggy or rainy.

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**PART 2 PRODUCTS**

*2.1 BITUMINOUS TACK COAT*

- A. Asphaltic emulsion products shall comply with Section 94 of State Standard Specifications.

**PART 3 EXECUTION**

*3.1 GENERAL*

- A. Protect the surface of sidewalks, curbs, other structures, and trees adjacent to the area being treated from being spattered or marred. If surfaces become spattered, clean in accordance with manufacturer's recommendations.
- B. Do not clean or discharge distributor outside the project limits of work.

*3.2 DISTRIBUTOR*

- A. Bituminous distributor and equipment for heating bituminous material shall be designed, equipped, maintained, and operated so that bituminous material, at even heat, may be applied uniformly on variable widths of surface up to 15 feet at readily determined and controlled rates from 0.02 to 1.0 gallons per square yard, with uniform pressure. Distributor equipment shall include a tachometer, pressure gauges, accurate volume measuring devices or a calibrated tank, and a thermometer for measuring temperatures of tank contents. Distributors shall be equipped with a power unit for the pump, and a full circulation spray bar adjustable laterally and vertically.
- B. When applying tack and prime coats, take care to give the surface a very light, even application of asphalt.

*3.3 PREPARATION OF SURFACE*

- A. Immediately before applying the tack or prime coat, remove loose material, dirt, clay or other objectionable material. Take particular care in cleaning the outer edges of the strip to be treated, to ensure that the prime or tack coat will adhere.
- B. Do not apply Prime Coat or Tack coat so far in advance that it might lose its adhesiveness as a result of being covered with dust or other foreign material.

*3.4 APPLICATION*

- A. Tack Coat: Apply tack coat uniformly in 1 application, per State Standards. Apply within 24 hours preceding placement of the covering course.
- B. Tack coat of asphaltic emulsion shall be furnished and applied in conformance with the provisions in Section 39 and 94, State Standards Specifications and shall be applied to surfaces to be paved and all vertical surfaces of existing pavement, curbs gutters and construction joints in the surfacing against which additional material is to be placed, and to other surfaces designated in the special provisions.

BITUMINOUS PRIME COAT AND TACK COAT  
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**END SECTION**

BITUMINOUS PRIME COAT AND TACK COAT  
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BITUMINOUS PRIME COAT AND TACK COAT  
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**SECTION 32 12 16**  
**ASPHALT CONCRETE PAVING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of constructing one or more surface courses composed of a mixture of aggregate, filler if required, asphalt material and placed on a prepared base to lines, grades and details, as shown on the plans and covered within these specifications. This section includes asphalt patching for areas where utility lines cross existing paved surfaces, trench resurfacing, saw cutting and resurfacing additional paving widths as required in the contract or under permit requirements.
- B. Mix aggregate and asphalt binder at a central mixing plant. Haul, spread, and compact the mixture for paved areas as shown and as specified.
- C. Upon completion of all paving, finish the entire roadway. Trim and shape cut and fill slopes to produce smooth surfaces and uniform cross sections. Clean the finished pavement of all dirt and foreign material.
- D. Cross sections of paving shall be as indicated in the Plans.

*1.2 RELATED WORK*

- A. Section 31 05 00 – Common Work Results for Earthwork
- B. Section 32 11 23 – Aggregate Base

*1.3 REFERENCES*

- A. Section 22 – Finishing Roadway, State Standard Specifications
- B. Section 39 – Asphalt Concrete, State Standard Specifications
- C. Section 92 – Asphalt Binders, State Standard Specifications
- D. Section 94 – Asphaltic Emulsions, State Standard Specifications
- E. Section 96 – Geosynthetics, State Standard Specifications

*1.4 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittal Procedures.
- B. Certificates:
  - 1. Certification from the supplier that the asphalt concrete is of correct type and meets requirements of this section.

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2. Job mix formula shall be submitted with certification that the mix formula meets the requirements of Standard Specification Specifications Section 39, Asphalt Concrete. The job mix formula shall include definite single values for:
  - a. The percent of aggregate passing the specified sieve, based on dry weight of aggregate.
  - b. The percent of bituminous material to be added, based on the total weight of the mix.
  - c. Kind and amount of chemical additives (anti-stripping, hydrated lime, etc.) as established by the design procedure.
  - d. Maximum theoretical density.
  - e. Temperature ranges for the bituminous material at the point of mixing with the aggregates and bituminous mixture at the paving machine.

**1.5 QUALITY ASSURANCE**

- A. Asphalt concrete supplier to prepare a mix design; to recommend adjustments to the proportions of the mix, as necessary, to conform to the mix design; and to consult with the Contractor and the Engineer during paving as required.
- B. Testing required to, determine compliance for the work of this section shall be performed by an independent testing laboratory, approved by the Engineer and appointed and paid for by the Contractor. The independent testing laboratory shall be used to sample and test asphalt concrete at the job sites. One test shall be taken for each paving period and at least one test every four hours. As a minimum, results of the test shall include items A, B, C and E of the job mix formula submittal.
- C. Density: Acceptable density of the in-place asphalt concrete pavement shall be 95 percent of the optimum values as determined from the mix design formula. Field sampling and density determination shall be made in accordance with an accepted nuclear procedure.
- D. Testing shall be performed in such a manner that will least encumber the performance of the work. The Contractor shall cooperate by rerouting equipment or by temporarily closing the immediate work area to be tested.
- E. Contractor shall instruct the testing laboratory to provide the test results to the Engineer immediately in the field and a copy of the written report sent directly to the Engineer.

**PART 2 PRODUCTS**

**2.1 ASPHALTS**

- A. Asphalt binder to be mixed with aggregate shall be liquid asphalt PG 64-10, conforming to State Standard Specifications Section 92, Asphalt Binders.

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- B. Asphalt Concrete shall be Type A, in accordance with State Standard Specifications 39-2.02.

2.2 *AGGREGATE*

- A. The combined aggregate grading of the asphalt concrete shall be Type A, 3/4-inch maximum grading, per Section 39-2.02B(4)(b), of the State Standard Specifications.

2.3 *PAVEMENT REINFORCING FABRIC*

- A. Reinforcing fabric shall be non-woven, conforming to Section 96-1.02J, "Paving Fabric", of the State Standard Specifications.
- B. Fabric shall be protected from damage during storage, handling and installation in accordance with manufacturer's requirements.

2.4 *FORMS*

- A. Redwood header boards shall be two inches wide by six inches deep (nominal measurement).
- B. Metal forms shall be submitted to Engineer for approval prior to use.

**PART 3 EXECUTION**

3.1 *GENERAL*

- A. The pavement section shall comply with Tulare County Standards and as shown on the Plans.
- B. Prior to any paving and surfacing operations, all pipes and conduits shall be installed and properly backfilled as shown.

3.2 *STORAGE*

- A. Storage of materials shall comply with the requirements of Section 39, State Standard Specifications.

3.3 *MIXING*

- A. Mixing shall conform to the approved mix design.
- B. The weight of asphalt binder to be mixed with aggregate shall be between 3 percent and 7 percent of the weight of the dry aggregate.

3.4 *SUBGRADE*

- A. Subgrade shall conform to Section 39-2.01C(3)(b), State Standard Specifications.

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- B. Unless otherwise specified, the upper six inches of subgrade beneath the structural section shall be scarified, moisture conditioned as necessary and compacted to at least 95 percent relative density.

3.5 *EQUIPMENT*

- A. Spreading and compacting equipment shall conform to State Standard Specifications Section 39-2.01C(2), Spreading and Compacting Equipment.

3.6 *PLACING AND COMPACTING*

- A. Placing and compacting shall conform to State Standard Specifications Section 39-2.05A(3)(d), Placing and Compacting Hot Mix Asphalt.
- B. Apply mixture only during hours of daylight; when air temperature is 50 degrees F or higher; when surfaces to be paved are dry and free of frost, snow or ice; and when precipitation is not imminent.

3.7 *PAVEMENT REINFORCING FABRIC*

- A. Fabric shall be protected from damage during storage, handling and installation in accordance with manufacturer's requirements.
- B. Pavement reinforcing fabric shall be placed, with paint binder, on all surfaces to receive an asphalt concrete overlay in accordance with State Standard Specifications Section 39-2.01C(3)(g), Geosynthetic Pavement Interlayer, and the following provisions:
  - 1. Pavement surface shall be cleaned of loose material all cracks filled with emulsion slurry. The prepared surface shall be treated with paint binder at the rate of 0.25 gallons per square yard or as directed by the Engineer. Paint binder shall be un-cut asphalt or asphalt emulsion free of solvents and shall be applied at the proper temperature for the material.
  - 2. Reinforcing fabric shall be carefully placed to avoid wrinkles. Any wrinkles longer than 1 inch shall be cut and laid flat in the direction of the paving operation. Material shall be lapped four to six inches for transverse joints and two to four inches for longitudinal joints. Extra tack coat shall be applied to joints to ensure proper bonding.

3.8 *FORMS*

- A. Wood or metal. Place true to line and grade, and anchor securely. Use adequately sized forms or prevent bulging and bending while the bituminous surface is being worked.

3.9 *COLD PLANE ASPHALT CONCRETE PAVEMENT*

- A. Existing asphalt concrete shall be cold planed at the locations and to the dimensions shown on the plans and in accordance with these special provisions.

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- B. The depth, width and shape of the cut shall be as indicated on the typical cross sections or as directed by the Engineer. The final cut shall result in a uniform surface conforming to the typical cross sections. The road surfacing to remain in place shall not be damaged in any way.
- C. The depth shown on the plans for cold plane wedge cuts along existing concrete gutter are to be measured from the surface of the concrete gutter. In some cases where a prior overlay surface was constructed above the gutter lip, the actual depth of cut will exceed the dimension shown on the Plans.
- D. The Contractor shall remove existing pavement overlay from the top surface of gutters adjacent to any area specified to be cold planed.
- E. The planing machine shall be self-propelled and especially designed and built for grinding flexible pavements. It shall plane without tearing or gouging the underlying surface and blade material in a windrow. Drum lacing patterns shall permit a grooved or smooth surface finish as selected by the Engineer and the drum shall be totally enclosed in a shroud to prevent discharge of any loosened material into adjacent work areas. A zero (0) to three (3) inches deep cut to predetermined grade may be required on one (1) pass. The machine shall be adjustable as to crown and depth. The equipment shall meet the standards set by the San Joaquin Valley Air Pollution Control District and the Air Quality Act of 1969 for noise and air pollution.
- F. The Contractor shall provide a smaller machine to trim areas inaccessible to the larger machine at manholes, curb returns and intersections. The smaller machine shall be equipped with a 12-inche wide cutting drum mounted on a three-wheel chassis allowing it to be positioned without interrupting traffic or pedestrian flow. Jack hammering areas not accessible to grinding machine will not be allowed.
- G. The surface tolerance produced shall be such that a ten-foot straight edge laid laterally will indicate variances of less than three-eighths (3/8) inch. The Contractor shall remove all loosened material from the roadway each day before leaving the site of the work.
- H. The Contractor shall protect structures and provide necessary traffic control and barricades as required by the Engineer.
- I. Temporary oil-sand ramps shall be constructed at intersecting streets, and along longitudinal joints, immediately after cold planing and prior to opening the lanes to traffic. Cold planing operations shall not commence until temporary oil-sand is on site with workers to place material.
- J. Cold planing cuts across travel lanes shall be the last cuts made at each side. After removal of loosened material from such cuts, temporary ramps shall be constructed of oil-sand at the deep end of cuts before opening the lane to traffic.
- K. Irregular, gouged, ripped or damaged areas, as determined by the Engineer, shall not be accepted. All such areas shall be repaired by methods approved by the Engineer, prior to resurfacing operations. The Engineer, at his discretion, may require substitution of planing machine and/or operating personnel if the cold-planed surface does not meet these specifications.

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- L. Existing traffic detector loops damaged during cold plane operations will be returned to their original condition.
- M. After conducting cold planing operations on a given street, the Contractor shall begin pavement operations on that street within seven calendar days. Deviations from this requirement must be requested in writing and approved by the Engineer prior to the beginning of planing operations.

3.10 MISCELLANEOUS AREAS

- A. Paving miscellaneous areas shall conform to State Standard Specifications Section 39-2.01C(9), Miscellaneous Areas and Dikes.

3.11 FINISHING PAVED AREAS

- A. Finishing roadway and parking areas shall conform to the provisions of State Standard Specifications Section 22, Finishing Roadways.

3.12 TRENCH RESURFACING

- A. At areas where asphalt concrete had been removed due to pipeline construction, trench shall be resurfaced with asphalt concrete. Unless otherwise noted, asphalt concrete resurfacing shall match the existing thickness of the asphalt and base course removed.
  - 1. Base course shall be as specified in Section 32 11 23, Aggregate Base, and in this Section.
- B. If an edge of a trench resurfacing occurs within three feet of an existing edge of pavement, lip of gutter or the face of curb, or if no gutter is present, the Contractor shall remove all existing paving to the lip of gutter or curb face and or, edge of existing pavement and resurface with the applicable trench resurfacing section. The limits of removal are minimum requirements.
- C. If during the Contractor's operations pavement is disturbed outside the limits of removal, Contractor shall make the necessary repairs at no additional cost to the Owner.

3.13 ACCEPTANCE REQUIREMENTS

- A. Surface Tolerance: The variation between any two contacts with the surface shall not exceed  $\pm 0.015$  foot in 10 feet. Correct all humps or depressions exceeding the specified tolerance by removing defective work and replacing it with new material at no additional expense to the Owner.
- B. A uniform compacted thickness shall be obtained for each course equal to or greater than the thickness shown. Individual tests shall not vary by more than  $\pm 0.02$  foot.
- C. Width: Plan dimension,  $\pm 0.02$  foot.
- D. Thickness: Plan dimension,  $\pm 0.02$  foot.



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**END SECTION**

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**SECTION 32 17 23**  
**TRAFFIC SIGNING, STRIPING AND MARKING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. This section includes removal and installation of traffic signs, markers, posts, pavement striping, pavement markings, raised pavement markers, and curb markings.

*1.2 RELATED WORK*

*1.3 REFERENCES*

- A. American Society for Testing and Materials (ASTM)
- B. State of California, Business, Transportation, and Housing Agency, Department of Transportation Standard Specifications, and Standard Plans, State Standard Specifications and State Standard Plans), as cited below.

*1.4 SUBMITTALS*

- A. Complete assembly, installation drawings, detailed specifications and data covering materials used and accessories forming part of the furnished product shall be submitted in accordance with Section 01 33 00 - Submittals.

**PART 2 PRODUCTS**

*2.1 SIGNS AND ROADSIDE MARKERS*

- A. Conform to Section 56 of the State Standard Specifications and Standard Plans.
- B. Signs or material shall conform in size and design to the latest editions of the FHA publication "Standard Highway Signs," the Caltrans' Sign Specification Sheets, and the California Manual on Uniform Traffic Control Devices (California MUTCD) and the Caltrans' Supplement thereto as to color, shape, and style of letters or symbols. Signs shall be of standard size or as noted on the Drawings.
- C. Material:
  - 1. Metal: Base metal shall be sheet aluminum, 0.080 inch thick, Alloy 6061-T6 or 5052-H38 in conformance with ASTM B209.
  - 2. Reflective Sheeting: Reflective sheeting, whether used as legend or background, shall be FHWA FP-85 Type IIA (Super Engineering Grade).
  - 3. The reflective material and screening inks or overlay film shall be graffiti-proof. The method for graffiti proofing shall be F-cal by Nikkalite or equal.

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Neither the color nor the reflective intensity of the finished sign shall be significantly diminished by the use of graffiti remover.

**2.2 STRIPING AND PAVEMENT MARKING**

- A. Traffic stripes and pavement markings, including legends, shall be thin-mil thermoplastic (sprayable) or paint as indicated on the Drawings.
- B. Curb markings and median island markings shall be AQMD- or APCD-compliant paint material.
- C. Striping and raised pavement markers shall comply with State Standard Plans A20A, A20B, A20C, and A20D.
- D. Pavement markings shall comply with State Standard Plans A24A, A24B, A24C, A24D, and A24E.

**2.3 PAINT**

- A. Paint shall be fast or rapid-dry type solvent conforming to Section 84 of the State Standard Specifications and shall meet requirements of San Joaquin Valley Air Pollution Authority. Apply the paint at the rate recommended by the manufacturer.

**2.4 THIN-MIL THERMOPLASTIC (SPRAYABLE)**

- A. Thin-mil thermoplastic traffic stripes and pavement markings shall conform to Section 84-2 of the State Standard Specifications.
- B. Pre-mix glass beads within the thermoplastic material and apply immediately after spraying.

**2.5 RAISED PAVEMENT MARKERS**

- A. Raised pavement markers shall conform to Section 81-3 of the State Standard Specifications. Reflective pavement markers shall have abrasion-resistant surfaces.
- B. Use hot-melt bituminous adhesive for placement of pavement markers. The adhesive shall be an asphaltic material with homogeneously mixed filler.

**2.6 SIGNPOSTS**

- A. Signpost shall be as indicated on the Drawings. Post height shall be as needed for the minimum clearance beneath the sign as specified in Caltrans' Standard Plan RS1.
- B. Fasten signs to posts per State Standard Plans RS2, RS3, and RS4.

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**PART 3 EXECUTION**

**3.1 INSTALLATION OF SIGNS**

- A. Install new and relocate existing signs as noted in the Drawings; protect-in-place existing signs, posts, and parking meters which are not to be removed; and replace any of these which are damaged during construction.
- B. Signs installed in parkways, sidewalks, or pedestrian areas shall have a minimum of 7 feet of clearance from the bottom of the sign to the finished surface except when a sign is installed on raised median island.

**3.2 APPLICATION OF REFLECTIVE SHEETING**

- A. Apply reflective sheeting to the sign per the sheeting manufacturer's recommendations to produce a durable bond equal to or greater than the strength of the reflective sheeting. No air pockets or bubbles shall exist between the sheeting and the aluminum backing.

**3.3 SPLICING (REFLECTIVE COATING)**

- A. No splice will be allowed other than that which occurs in the manufactured roll of reflective sheeting on panels with a minor dimension of 48 inches or less. On rectangular signs, the splice shall be horizontal. No finished sign shall have more than one splice, and no splice shall fall within 2 inches of the sign edge. When splices do occur, the adjoining reflective sheets shall be color matched under both incident and reflective light.

**3.4 DELIVERY OF SIGNS**

- A. Signs shall be in a new condition with no scratches or tears in the reflective sheeting.

**3.5 REMOVAL OF EXISTING MARKINGS**

- A. Remove existing striping, pavement markings, curb marking, and raised pavement markings superseded by the Drawings. Remove conflicting striping within limit of project.
- B. Removal of stripes and markings shall be by sandblasting. Remove thermoplastic and pavement tape striping by grinding or abrasive blasting.

**3.6 TEMPORARY STRIPING**

- A. Contractor is responsible for installing temporary stop limit lines and lane lines after completing the paving work and prior to opening the streets to traffic. Temporary traffic striping shall be installed within 24 hours after paving the street.
- B. Temporary limit lines shall be reflective tape designed for traffic application. Minimum width of tape shall be eight inches
- C. Temporary lane lines shall be reflectorized chip seal markers (single for 4-inch line; double for 8-inch line) at 24 feet on center.

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- D. No additional payment to the Contractor shall be made for installation of temporary pavement striping.

3.7 *FINAL STRIPING*

- A. Cat tracking shall be placed and the alignment reviewed and approved by the Owner's Representative prior to placing final stripes and markings.
- B. Final stripes and markings, including limit lines, shall be placed within 72 hours after the street has received the final surface course or fog seal and after temporary striping and markings have been removed.
- C. Restripe any existing striping on cross streets that are disturbed by construction.
- D. Apply striping only during daylight hours when the temperature exceeds 55 degrees F, weather conditions are favorable and the pavement surface is clean and dry.

3.8 *INSTALLATION OF THIN-MIL THERMOPLASTIC (SPRAYABLE)*

- A. Apply thin-mil thermoplastic material for traffic stripes by spray method in single uniform layer at the minimum thickness of 30 mils and not to exceed 45 mils.
- B. Apply thin-mil thermoplastic material to the pavement at a temperature between 350°F and 400°F, unless the manufacturer recommends a different temperature.

3.9 *PROTECTION AND ACCEPTANCE*

- A. Protect pavement markings until dry or bonded by placing guards or warning devices as necessary and in accordance with MUTCD. In the event any vehicle should cross the wet marking, such marking shall be reapplied and marks, made by the vehicle, removed by the Contractor at no additional expense to the Owner.
- B. Markings shall be accurately placed, and appear clean and uniform day and night. Unsatisfactory markings shall be corrected at no additional expense to the Owner.
- C. The Contractor shall remove and replace at no additional expense to the Owner and to the satisfaction of the Engineer any material which exhibits any of the following deficiencies:
  - 1. Non adherence to paving surface.
  - 2. Material improperly set or tracked.
  - 3. Insufficient film thickness or width of stripe.
  - 4. Insufficient glass bead coverage or retention.
  - 5. Materials spilled or improperly placed.

3.10 *APPLYING PAINT FOR TRAFFIC AND PARKING LOT STRIPING AND MARKING*

- A. Apply in accordance with Section 84-2.03 of the State Standard Specifications.

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**3.11 *INSTALLING PAVEMENT MARKERS***

- A. After the application of pavement striping and markings, install markers on new paved surfaces and existing surfaces that were damaged by the construction. Install in accordance with Section 81-3.03 of the State Standard Specifications.
- B. Use markers that are reflective and match the color or combination of colors of existing markers within the area of work. Install markers along the alignment and match spacing of the existing.

**3.12 *INSTALLING FIRE HYDRANT MARKERS***

- A. Install a blue reflective marker opposite each fire hydrant. Place the marker on the pavement and locate six inches off the centerline of the traffic striping or reflective pavement markers towards the hydrant. Install markers in accordance with Section 81-3.03 of the State Standard Specifications. Where existing fire hydrants have been relocated or removed from service, dislodge the existing blue marker from the existing blue marker from the pavement and dispose.

**END SECTION**

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**SECTION 33 05 26**  
**UTILITY LINE MARKING**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work of this section consists of furnishing and installing utility line marking tape in the trench above newly constructed utility lines.

*1.2 SUBMITTALS*

- A. As specified in Section 01 33 0 0 – Submittal Procedures.
- B. Samples: 24-inch strips of tape and two markers.
- C. Certification that the materials used in the tape fabrication meet the requirements of this section.
- D. Installation procedure if the cable is installed by plowing.

**PART 2 PRODUCTS**

*2.1 MARKING TAPE*

- A. Capable of being inductively detected electronically.
- B. Construction: Metallic foil laminated between two layers of impervious plastic film not less than 3 inches wide. Total thickness of tape shall not be less than 0.005 inch (5 mil),  $\pm 10$  percent manufacturing tolerances.
  - 1. Film: Inert plastic. Each film layer shall be not less than 0.001 inch (1.0 mil) thick.
  - 2. Foil: Not less than 0.001 inch (1.0 mil) thick.
  - 3. Adhesive: Compatible with foil and film.
- C. Imprint: 3/4-inch or larger bold black letters.
- D. Legend: Identify buried utility line tape with imprint such as "Caution: Sewer Line Below". Repeat identification at approximately 24 inch intervals.

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E. Background Color: APWA color code and as specified in the following table.

Color	Utility
Safety Red	Electric
High Visibility Safety Yellow	Gas, Oil, Steam, Dangerous Materials
Safety Alert Orange	Telephone, Communications, Cable Television
Safety Precaution Blue	Water System, Irrigation
Safety Green	Sanitary Sewer, Storm Sewer
Safety Brown	Force Mains and Effluent Lines
Purple	Reclaimed Water

F. Manufacturer: Lineguard, Inc., Wheaton, Illinois; Reef Industries, Inc., Houston, Texas; Thor Enterprises, Inc., Sun Prairie, Wisconsin; or Engineer-approved equivalent.

2.2 SURFACE MARKERS

- A. All markers shall have an identifying letter either cast or routed into marker. The Contractor has the option of any of the following. However, only one type shall be used on any one project:
- B. Cast-In-Place Concrete.
  - 1. Concrete: As specified in Section 03 33 00 – Cast in Place Concrete.
  - 2. Reinforcement: One No. 5 bar in center of the marker.
- C. Precast Concrete: Commercially fabricated concrete marker meeting design dimensions and concrete reinforcing requirements.
- D. Timber Posts: Any softwood lumber species meeting PS 20-70. Grade No. 1 or better, free of heart center, S4S as shown. Pressure treat timber posts for soil contact with waterborne preservative in accordance with AWPA C2-90.

2.3 TRACER WIRE

- A. Minimum: No.10, solid, 12 AWG copper wire with Type TW insulation. Join so as to form a mechanically and electrically continuous line throughout the length of the marked pipe.

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**PART 3 EXECUTION**

**3.1 MARKING TAPE**

- A. Install tape in backfill directly over each buried utility line as shown on the detailed drawings.
- B. Unless otherwise shown, tape shall be installed a minimum 1.5 feet below finish grade. However, in no case shall tape be placed closer than two feet above the top of the pipe.
- C. Where utilities are buried in a common trench, identify each line by a separate warning tape. Bury tapes side by side directly over the applicable line.

**3.2 TRACER WIRE**

- A. Wherever PVC or Polyethylene pipe is installed in the ground, a tracer wire shall be installed. Conductors shall be spliced in accordance with Division 26, Electrical.
  - 1. Tracer wire shall be brought to the surface at all gate and butterfly valves, air valves, blow-offs, Fire Hydrants, Water Services, and other pipeline appurtenances
- B. Tracer Wire: Attachment of the wire to the pipe shall be made with plastic tie-wraps or other approved method.
- C. Contractor shall conduct a satisfactory continuity test prior to Owner acceptance.

**3.3 SURFACE MARKERS**

- A. In addition to marking tape, install surface markers at all changes in horizontal direction and at intervals not exceeding 400 feet.
- B. Tracer wire shall be wrapped around cast iron valve boxes; while ensuring wire conductors are making contact with valve box.
  - 1. Tracer wires shall be tied together to a No. 5 rebar cast in a concrete utility line marker and terminate above grade. Allow sufficient slack in tracer wire along pipe to allow for pipe shrinkage and expansion.

**END SECTION**

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**SECTION 35 20 16**  
**WATER CONTROL GATE**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. The work required under this section consists of related items necessary and required to complete the work. The Contractor shall provide all items, and operations, including all labor, materials, equipment, and incidentals necessary for completion of work.
- B. Slide Gates

*1.2 RELATED WORK*

- A. Section 03 15 20 – Anchor Bolts and Expansion Anchors
- B. Section 03 30 00 – Cast In Place Concrete
- C. Section 09 90 00 – Painting

*1.3 SUBMITTALS*

- A. As specified in Section 01 33 00 – Submittals.
- B. Acknowledgment that products submitted meet the requirements of standards referenced.
- C. Operation and Maintenance Manuals:

*1.4 QUALITY ASSURANCE*

- A. Referenced Standards:
  - 1. American Society for Testing Materials (ASTM):
    - a. A126, Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
    - b. A276, Stainless and Heat-Resisting Steel Bars and Shapes.
    - c. D4020 UH MWP
    - d. B139, Phosphor Bronze Rod, Bar and Shapes
    - e. B209, Aluminum and Aluminum Alloy Sheet and Plate.
  - 2. American Water Works Association (AWWA):
    - a. C513-05, Open Channel, Fabricated-Metal Slide Gates and Open-Channel, Fabricated-Metal Weir Gates.

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- b. C560-00, Cast-Iron Slide Gates.
3. Powered Gates
  - a. National Electrical Manufacturers Association (NEMA):
    - 1) 250, Enclosures for Electrical Equipment.
    - 2) ICS 6, Enclosures for Industrial Control and System.
4. NFPA Style MF1.

**PART 2 PRODUCTS**

**2.1 ACCEPTABLE MANUFACTURERS**

- A. Subject to compliance with the Contract Documents, the following  
Manufacturers are acceptable:

1. Slide gates:
  - a. Fresno Valves and Castings Series 6400 Model 20-10C.
  - b. or Waterman C-20 Canal Gate.

**2.2 SLIDE AND WEIR (DOWNWARD OPENING) GATES**

- A. General:

1. Self-contained slide gates with operators in accordance with the configuration noted in the gate schedule or shown on the Contract Drawings.
2. Maximum leakage rate: Not to exceed 0.1 gpm per foot of seat perimeter with water at top of gate slide and operating in seating position.
3. Refer to Drawings for schedule, operator size, and other requirements.

- B. Material:

1. Slide:
  - a. Stainless steel: ASTM A276, Type 316L.
2. Frame, guides, guide rails, cross bars, and head rails:
  - a. Stainless steel: ASTM A276, Type 316L.
3. Anchor bolts:
  - a. Stainless steel: ASTM A276, Type 316L.

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4. Stems and stem couplings:
    - a. Chrome-Plated Stainless steel: ASTM A276, Type 316L.
  5. Side Seals: UHMWPE.
- C. Fabrication:
1. Frame and guides:
    - a. Rigid, welded gate frame and guides: Composed of the guide rails, cross bars, and headrails, with a clear opening the same size as the waterway, unless otherwise specified.
    - b. Flatback, spigotback, or embedded type as shown on Contract Drawings.
    - c. Construct guides incorporating a dual slot design. 1) The primary slot will accept the plate of the slide (disc). 2) The secondary slot will be sufficiently wide to accept the reinforcing ribs of the disc.
    - d. Design guides for maximum rigidity: Weight not less than 3 LBS per foot.
    - e. Guides of sufficient length to support two-thirds the height of the slide, when the gate is fully open.
    - f. Extend the head angle or yoke 42 IN above the operating floor.
    - g. Provide guides of sufficient strength so that no further reinforcing will be required.
    - h. Design yoke to support the operating device formed by members welded or bolted at the top of the guides.
    - i. Design yoke arrangement such that the disc and stem can be removed without disconnecting yoke.
    - j. Design yoke to support the lift forces when subjected to a load of 80 LB pull on the operator.
    - k. Design gates with J-seals at the side attached to frame.
    - l. For embedded type gates provide molded resilient seat mounted at bottom of disc for flush bottom closure and seal against embedded portion of the frame in the channel invert or have a resilient seat mounted on frame flush at channel invert.
    - m. Design weir gates or downward opening gates with J-seal attached to bottom frame.

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- n. Design bottom frame member as a minimum of 3 IN of material bearing against slide for weir or downward opening gates.
- o. Utilize J-seals and resilient seats of synthetic rubber conforming to AWWA C501.
- p. Self adjusting side seals, replaceable.

2. Slide:

- a. Plate reinforced slide with structural shapes welded to the plate.
- b. Slide cover maximum deflection: 1/360 of the span of the gate under maximum head.
- c. Extend reinforcing ribs to guides so that the seating surface of the guide is reinforced.
- d. Stem connection of either clevit type, with structural members welded to slide and a bolt to act as pivot pin, or a threaded and bolted (or keyed) thrust nut supported in welded nut pocket.
- e. Pocket and yoke of gate capable of taking at least twice the rated thrust output of the operator at 40 LBS pull. Slide material same as frame and guides.

3. Stem:

- a. Of suitable length and ample strength for the intended service.
- b. Stem diameter capable of withstanding twice the rated output of the operator, and supported such that L/r ratio for unsupported part of the stem shall not exceed 200.

D. Coatings:

- 1. Coat all exposed metal surfaces, including stem guide, slide gate per Section 09 90 00 - Painting.

2.3 *GATE OPERATORS AND LIFTS*

- A. Refer to drawings for size and schedule.

2.4 *ALL GATES, VALVES, OPERATORS AND LIFTS*

- A. Provide gates, including lift, designed with a minimum safety factor of five. Provide rising stems on all gates.



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**PART 3 EXECUTION**

**3.1 FIELD QUALITY CONTROL**

- A. Installation Check and Startup: Employ and pay for services minimum of 8 hrs of the equipment manufacturer's field service representative(s) fully commissioned and authorized by manufacturers to do the following:
1. Inspect equipment covered by these Specifications.
  2. Supervise adjustments, calibrations and installation checks and full commissioning.
  3. Perform basic operational checks.
  4. Provide Owner with a written statement that manufacturer's equipment has been installed properly, lubricated, and calibrated and is ready for operation by the Owner.
- B. Field Leakage Test for Weir and Slide Gates:
1. Test gate under design seating head and adjust to maximum leakage of 0.1 gpm per foot of seating perimeter.

**END SECTION**

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**SECTION 40 05 00**  
**PIPE AND FITTINGS**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Furnish, install, and test all water, utility, pipe, fittings, and appurtenances as indicated and as specified.

*1.2 RELATED WORK*

- A. Section 03 30 00 - Cast-In-Place Concrete
- B. Section 09 90 00 - Painting and Coating
- C. Section 31 05 00 – Common Work Results for Earthwork
- D. Section 31 23 17 – Trenching, Backfilling, and Compacting

*1.3 REFERENCES*

- A. California Plumbing Code
- B. American Water Works Association Standards

*1.4 SUBMITTAL REQUIREMENTS*

- A. Submittals shall be in accordance with Section 01 33 00 - Submittals Procedures.
- B. Submit manufacturer's catalog data. Show manufacturer's model number.
- C. Submit dimensions including wall thickness and materials of construction by reference standard and grade. Submit information on interior and exterior coatings as applicable.

*1.5 QUALITY ASSURANCE*

- A. All work performed under this section shall meet all recommendations and requirements of AWWA, California Plumbing Code, NFPA 24, ASTM D2774, and all other applicable national, state, local, standards and regulations.

*1.6 MATERIALS*

- A. All materials in contact with potable water shall be certified to ANSI/NSF Standard 61.

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**PART 2 PRODUCTS**

*2.1 POLYVINYL CHLORIDE WATER PIPE (PVC)*

- A. General: PVC pipe 4 inches through 12 inches in diameter shall conform to AWWA C900, unless otherwise specified. PVC pipe 14 inches in diameter and larger shall conform to AWWA C905, unless otherwise specified.
- B. The pipe shall be minimum DR 41 unless shown otherwise. Each length of pipe shall be marked with the manufacturer's name, nominal size, pressure classification, and date of manufacture.
- C. Joints: Joints shall be push-on type couplings or integral socket bell PVC pipe unless otherwise shown with rubber gaskets conforming to ASTM D3139 and ASTM F477. Integral socket bells of PVC pipe or separate couplings shall meet the same strength requirements as that of the pipe. All component parts of each joint including gaskets and coupling shall be clearly marked for use with the pipe for which they are intended.
- D. Fittings: Fittings shall be of ductile iron conforming to ANSI A21.10 (AWWA C 153) for mechanical joints. Dimensional and material requirements for pipe ends, glands, bolts, nuts, and gaskets shall conform to ANSI A 21.11 (AWWA C111). Pipe smaller than 4 inches shall have screwed or grooved joints.

*2.2 FLEXIBLE COUPLINGS FOR GRAVITY PIPES*

- A. Transition type couplings shall be factory manufactured to ensure watertight fit and smooth flow transition at the joint. Couplings shall be made of resilient elastomeric PVC, with all stainless-steel coupling bands including screw and housing. All with earth movement while maintaining seal. Poured concrete collar and similar coupling methods will not be accepted.

*2.3 GROOVED COUPLINGS*

- A. Groove dimensions shall conform to AWWA C606.
- B. Grooved couplings for ductile iron shall be Victaulic Style 31;
- C. Flexible grooved couplings for steel pipe shall be Victaulic Style 77 or equal; rigid grooved couplings for steel pipe shall be Victaulic Style 07 or equal. Couplings shall be rigid unless otherwise noted on the drawings.
- D. Grooved - Flanged adapters shall be Victaulic Style 341 for ductile iron pipe and Style 741 for steel pipe or equal.
- E. Grooved coupling for high density polyethylene pipe shall be Victaulic Style 995 or 997 or equal.

*2.4 FLANGED JOINTS*

- A. Flange shall conform to ANSI B16.5, Class 150.

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- B. All steel hardware installed underground shall be coated with a rust preventative, wrapped with 4 mil polyethylene sheeting, and secured with PVC tape.
- C. Gaskets shall be meet the pressure requirements of the adjoining flanges and shall conform to AWWA C-207. Gaskets for flat faced flanges shall be 1/8-inch thick.
- D. Gaskets for metallic pipe and non-potable 150 psi or less services shall be acrylic or aramid fiber bound with nitrile; Garlock Blue-Gard 3000 or equal. EPDM rubber gaskets, Garlock 98206 or equal, are also acceptable.
- E. Gaskets for metallic pipe and potable water service shall be NSF/ANSI-61 certified EPDM rubber, Garlock 98206 or equal.
- F. Gaskets for non-metallic flat faced flanges shall be constructed of a fluoroelastomeric material with a hardness of 70 durometer designed specifically for lower seating stress. Gaskets shall be certified to NSF/ANSI-61 for potable water service. Gaskets shall be Garlock Style XP or equal.

2.5 TRACER WIRE

- A. Install No. 10 solid-core copper tracer wire.

2.6 CONCRETE FOR THRUST BLOCKS

- A. As specified in Section 03 30 00 – Cast-In-Place Concrete. Thrust blocks shall be used only where specifically permitted on the drawings or with pre-approval from the Engineer.

2.7 JOINT RESTRAINT COUPLINGS

- A. Mechanical joint restraint coupling shall be of the type that utilizes the follower gland, and shall consist of several individual lug bolts with gripping mechanism that prevents the joints from pulling apart. Glands shall be ductile iron conforming to ASTM A536, and dimensions shall be compatible to be used with standard mechanical joint fittings for ductile rim pipe. The mechanical restraint joint shall have a minimum working pressure rating equal to that of the pipe with a safety factor of not less than 2. Restrained joints shall have twist off nuts to insure proper installation of restraining grip mechanism. Mechanical joint restrained coupling shall be EBAA, Iron, Inc. MEGALUG; with Mega-Bond coating.; or approved equal. Coating of gland follower body shall be electrostatically applied and heat cured polyester based powder. Wedge assemblies and bolts shall be coated with heat cured fluoropolymer coatings. Restraints shall be designed for the specific type of pipe to be restrained.
- B. Restrained joint fittings shall meet Uni-B-13 for PVC and be FM and UL approved through 12-inch for both ductile iron and PVC.
- C. Restrained joint fittings for high density polyethylene pipe shall be Victaulic 995 or 997 style coupling.

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**2.8 FASTENERS**

- A. All fasteners shall include washers under both bolt head and nut unless the use of washers is incompatible with the fitting design.
- B. Unless otherwise noted, all bolts, tie rods, and T-bolts used to secure flanges, fittings, and couplings located underground or submerged in liquid shall be Type 304 or 316 stainless steel per ASTM A320 or ASTM A193. Nuts shall be 304 or 316 stainless steel per ASTM A194 and washers shall be ASTM F436 Type 3.
- C. Unless otherwise noted, all bolts, tie rods, and T-bolts used to secure flanges, fittings, and couplings located indoors, above grade, and in vaults shall be carbon steel conforming to ASTM A307, Grade B with ASTM A563, Grade A nuts and ASTM F436 washers. Bolts, nuts, and washers shall be hot dipped galvanized in accordance with ASTM F2329. Stainless steel meeting the requirements of Paragraph B shall also be acceptable.

**PART 3 EXECUTION**

**3.1 HANDLING AND DISTRIBUTION OF MATERIALS**

- A. Delivery: Handle pipe carefully to ensure delivery at the project site in sound, undamaged condition. Contractor shall replace damaged pipe at no additional expense to the Owner.
- B. Storage: Do not store materials directly on the ground. Adequately support piping to prevent warping. Use protective covers where pipe may be damaged by direct sunlight.
- C. Before laying, pipe shall be inspected for cracked, broken, or defective pieces. Such pieces shall be rejected. Pipe shall be carefully lowered into the trench to prevent damage. All dirt or other foreign matter shall be removed from inside the pipe before lowering into the trench.

**3.2 COATING**

- A. Unless otherwise indicated in Part 2, all pipe and fittings shall be coated in accordance with specification 09 90 00.

**3.3 INSTALLATION OF UNDERDRAINS**

- A. Perforated pipes shall be laid with the perforations down.

**3.4 INSTALLATION OF BURIED PRESSURE PIPING**

- A. General: Pipe, fittings, and appurtenances shall be installed in accordance with the manufacturer's instructions and in accordance with the following references as appropriate:
  - 1. Ductile Iron Pipe - AWWA C600

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2. Polyvinyl Chloride Pipe and HDPE pipe - AWWA C605
  3. Steel Pipe – AWWA C604
- B. Handling: The pipe shall be protected to prevent entrance of foreign materials during laying operations. When laying is not in progress, open pipe ends shall be protected with a watertight plug or other approved means to exclude water or foreign material.
- C. Alignment:
1. Mains shall be installed to the grades and elevations indicated and shall have a minimum cover of 36-inches from the top of the pipe to existing ground or paved surface unless otherwise indicated.
  2. The allowable angle of deflection at any joint shall not exceed the amount recommended by the pipe manufacturer for the particular pipe size used. Deviation of any pipe section from the line and grade indicated shall not exceed 1/2-inch.
- D. Joints:
1. Pipe shall be assembled and joined in accordance with the manufacturer's published instructions for the type of pipe and joint used. All portions of the joints shall be thoroughly cleaned before the sections of pipe are assembled. The ends of each pipe shall abut against the next pipe section in such a manner that there shall be no unevenness of any kind along the bottom half of the interior of the pipe. Where mechanical joints are used, the pipe shall be marked in such a manner that it can be determined after installation that the pipe is properly seated.
  2. Where flexible couplings are used as expansion joints, the ends of the pipes shall be separated 1-inch to allow for expansion. The welded seam at the end of each coupled steel pipe shall be ground smooth for approximately 12-inches. Couplings shall be centered on pipe ends. Runs of pipe containing flexible couplings shall be properly blocked, anchored or tied to the structure to prevent joints from separating.
  3. Mechanical restrained joints shall be installed in accordance with joint manufacturer's instructions and recommendation.
- E. Installation of Marker Tape: Install tape in backfill directly over each pipeline, 24 inches over top of pipe, unless shown otherwise on the Plans. Where utilities are buried in a common trench, identify each line by a separate marker tape. Place tapes directly over the applicable line.

**3.5 THRUST BLOCKS OR MECHANICAL RESTRAINED JOINTS**

- A. Thrust blocks shall be used only where specifically allowed on the drawings or with prior approval by the Engineer.

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- B. Place concrete thrust blocks at all tees, elbows, plugs, and other locations where unbalanced forces exist in underground pipe in accordance with details shown. Place blocks between undisturbed ground and fitting to be anchored. Place blocking so that pipe and fittings will be accessible for repairs. Thrust blocks shall be of such size as to give bearing against undisturbed vertical earth banks sufficient to absorb the thrust from line pressure, allowing a maximum earth bearing pressure of 500 pounds per square foot per foot of depth below natural grade or as shown.
- C. Restrained joint fittings may be used in-lieu of thrust blocks, at the discretion of the Engineer. Contractor shall submit shop drawings showing methods of joint restraint for each type of restrained joint fitting to be used including the length of pipe having restrained push-on joints on all pipes which connect to the restrained fitting.
- D. When it is necessary to restrain push-on joints adjacent to restrained fittings, a harness restraint device shall be used. All harnesses shall have a pressure rating equal to that of the pipe on which it is used. Harness assemblies including tie bolts conform to ASTM A536.

3.6 ACCEPTANCE TESTS AND INSPECTION FOR GRAVITY PIPING

A. General

- 1. All testing and inspection shall be performed after final backfill and compaction operations are complete. If the Contractor so desires, he may pretest the lines at his own expense, but final testing must be performed after compaction requirements have been approved.
- 2. If any of the tests or inspections covered in this section indicates that lines require repair, then after repairs are complete, all testing and inspection shall be performed again. The cost of any retests, including time for the Engineer, shall be borne by the Contractor at no additional cost to the project.

B. Low-Pressure Air Test

- 1. Supply air to the test section slowly. A constant pressure of 3.5 psig shall be reached and maintain internal pressure of at least 3.0 psig for at least five (5) minutes.
- 2. After the stabilization period, disconnect the air supply. A pressure loss of 0.5 psig is used to compute the allowable pressure loss using the following formula.
- 3. The minimum allowable time in minutes for such a pressure drop is determined from the formula  $T_{\min} = 0.000183D^2L$ , where:
  - a. D = Nominal inside diameter of pipe (inches)
  - b. L = Length of pipe test section (feet)
- 4. Regardless of the formula, the minimum time allowed for pressure drop shall be eight (8) minutes.



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5. The pressure gage for monitoring the air pressure shall have a minimum division of 0.10 psi increments.
6. A valid test is when the air pressure is released from the opposite end of the inlet air entry connection with an air release apparatus outlet connection.
7. Adjustment of Pressure for Groundwater. Should the pipe section being tested lie below the local groundwater table, the test pressures shall be raised in proportion to the depth of the centerline of the pipe below the water table. Additional pressure (beyond the 3.5 psig specified above) shall be added at the rate of 0.433 psig per foot of depth below groundwater.

*3.7 ACCEPTANCE TESTS FOR BURIED PRESSURE PIPING*

A. General

1. All testing and inspection shall be performed after final backfill and compaction operations are complete. If the Contractor so desires, he may pretest the lines at his own expense, but final testing must be performed after compaction requirements have been approved.

B. In general, tests shall be conducted in accordance with AWWA C600 and C651 except as otherwise herein specified.

C. All newly installed sections of buried pressure piping shall be pressure and leakage tested as described herein.

1. For buried pressure pipelines, tests shall be made on two or more valved sections not to exceed 2,500 feet in length. The Contractor shall furnish all necessary equipment, material and labor required.
2. Tests shall be made after the trench has been backfilled and compacted, but not until at least 5 days have elapsed since any thrust blocks in the section have been poured.
3. The pipe shall be slowly filled with water and ensuring all air expelled from section being tested. The line shall stand full of water for at least twenty-four hours prior to testing to allow all air to escape. A test pressure equal to 1.5 times the design pressure, of the pipe measured at the point of lowest elevation pressure, or 100 psi, whichever is greater, shall be applied.
4. The test pressure in the line shall be maintained for a period of 2 hours. Test pressure shall be maintained within 5 psi during the test period. Conduct a leakage test concurrently with the pressure test. Leakage is defined as the volume of water that must be supplied into the newly laid pipeline to maintain pressure within +/- 5 psi of the test pressure after it is filled and purged of air. The water required to maintain test pressure shall be measured by means of a graduated barrel, drum, or similar device at the pump suction or through a meter.

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Allowable leakage at the specified test pressure shall not exceed the amounts allowed by AWWA C600,  $L = \frac{SD\sqrt{P}}{148,000}$

Where:

L = Allowable fluid loss, in gallon per hour.

S = Length of pipe tested, in feet.

D = Nominal diameter of the pipe, in inches.

P = Average test pressure during the hydrostatic test, in pounds per square inch (psi).

Hydrostatic testing allowance per 1,000 ft. of pipeline in gph.

PSI	4"	6"	8"	10"	12"	14"	16"	18"	20"	24"
200	0.38	0.57	0.76	0.96	1.15	1.34	1.53	1.72	1.91	2.29
175	0.36	0.54	0.72	0.89	1.07	1.25	1.43	1.61	1.79	2.15
150	0.33	0.50	0.66	0.83	0.99	1.16	1.32	1.49	1.66	1.99
125	0.30	0.45	0.60	0.76	0.91	1.06	1.21	1.36	1.51	1.81
100	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	1.62

5. Should testing disclose any visible leaks or leakage greater than that allowed, the defective joints or pipe shall be located, repaired, and re-tested until satisfactory. The cost of any retests, including time for the Engineer, shall be borne by the Contractor at no additional cost to the project.

3.8 ACCEPTANCE TEST FOR EXPOSED PIPING

- A. Pipe to be Tested - All new installed piping sections shall be pressure and leakage tested as specified herein.
- B. Pressure Testing - After the section of line to be tested has been filled with water or other test media, the test pressure shall be applied and maintained without interruption for 2 hours plus any additional time required for the Engineer to examine all piping undergoing the test and for the Contractor to locate all defective joints and materials.
  1. Test medium shall be potable water for potable water piping; all other piping may be tested using non-potable water subject to Engineer's approval.

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2. Pipe system shall be tested at 1-1/2 times the operating pressure, or 100 psi, whichever is greater, using the appropriate test fluid medium.
3. All piping shall be tight and free from leaks. All pipe, fittings, valves, pipe joints, and other materials that are found to be defective shall be removed and repaired or replaced with new and acceptable material, and the affected portion of the piping be retested until satisfactory. The cost of any retests, including time for the Engineer, shall be borne by the Contractor at no additional cost to the project.

Compressed air or gas under pressure shall not be used to test plastic piping unless specifically recommended by the pipe manufacturer.

Leakage may be determined by loss of pressure, soap solution, chemical indicator, or other positive and accurate method acceptable to the Engineer. All fixtures, devices, or other accessories which are to be connected to the lines and which would be damaged if subjected to the specified test pressure shall be disconnected and ends of the branch lines plugged or capped as required during the testing procedures.

**END SECTION**

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**SECTION 40 05 21**  
**TAPPING SADDLES SLEEVES AND VALVES**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. This section includes materials, testing, and installation of tapping sleeves, tapping valves, and tapping saddles for connection to existing piping.

*1.2 RELATED WORK*

- A. Section 09 90 00 – Painting and Coating
- B. Section 40 05 00 – Pipe & Fittings

*1.3 REFERENCES*

- A. American Society for Testing and Materials (ASTM)
- B. American Water Works Association (AWWA)

*1.4 SUBMITTALS*

- A. Submit shop drawings in accordance with the General Conditions and Section 01 33 00 - Submittals.
- B. Submit manufacturer's catalog data and detail construction sheets showing all valve and sleeve parts. Describe each part by material of construction, specification (such as AISI, ASTM, SAE, or CDA), and grade or type.
- C. Show dimensions including laying lengths.
- D. Show linings and coatings. Submit manufacturer's catalog data and descriptive literature.
- E. Submit six copies of a report verifying that the interior linings and exterior coatings have been tested for holidays and lining thickness. Describe test results and repair procedures for each part. Do not ship valves or sleeves to project site until the reports have been returned by the Owner's Representative and marked "Resubmittal not required."

**PART 2 PRODUCTS**

*2.1 GENERAL*

- A. Verify the type of existing pipe and the outside diameter of the pipe on which the tapping sleeve is to be installed.

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- B. Tapping sleeves and valves shall be designed to withstand a minimum working pressure equal to the working pressure of the system, but not less than 150 psi.
- C. Tapping saddles may be used for water main taps either concurrent with new construction, or for tapping existing water mains under pressure. Tapping saddles shall be limited to a maximum nominal outlet diameter of 2 inch.
- D. Tapping sleeves shall be used for making wet taps 4-inch nominal size and larger on existing water mains 6 inches nominal size and larger. Tapping sleeves shall not be used for water main taps for new water mains.

2.2 TAPPING SADDLES

- A. Tapping saddles used for taps on DIP water mains shall be double strap saddles for pipe sizes up to 16" and triple strap saddles for pipe sizes 18" and larger. Saddle bodies shall be ductile iron conforming to ASTM A536, grade 65-45-12, protected with a corrosion-resistant paint. The gasket shall be virgin NBR, or Buna-N rubber; formulated for treated water. Gaskets shall be cemented in place on the saddle bodies prior to shipment from the manufacturer. The bolts, nuts, and washers shall conform to the material requirements specified in Section 05 05 20. The saddle boss shall be tapped with standard iron pipe threads. Double strap saddles shall be Romac Style 202, Ford Style F202, or equal.
- B. Tapping saddles used for taps on PVC water mains shall have ductile iron bodies conforming to ASTM A536, grade 65-45-12, and protected with a corrosion-resistant paint. They shall have one or two 304 stainless steel bands. The bolts, nuts, and washers shall conform to the material requirements specified in Section 05 05 20. Single bands with four bolts (two bolts on either side of the saddle) shall be a minimum of 3¼" wide. Double bands with two bolts each (one bolt on either side of the saddle for each of the two bands for a total of four bolts) shall have a total combined width of not less than 3". The gasket shall be virgin NBR, or Buna-N rubber; formulated for treated water. Gaskets shall be cemented in place on the saddle bodies prior to shipment from the manufacturer. The saddle boss shall be tapped with standard iron pipe threads. The saddle bodies shall be preformed at the factory to fit cast iron OD PVC. Each body shall be marked with the OD to which it has been formed. Saddles for taps on PVC water mains shall be Ford Style FS 202 or FC 202 (epoxy coated body); or Romac style 202S or 202N (nylon coated body); or equal.

2.3 TAPPING SLEEVES

- A. Tapping sleeves shall be either cast iron split-sleeve type with a flanged outlet and mechanical joints to seal around the pipe (CI), or stainless steel split sleeves with a flanged outlet and a full-face rubber gasket to form the seal (SS), all as specified herein. These two types of tapping sleeves shall be limited to use on the water main materials, sizes, and tap sizes listed below:

<u>Water Main Size (in.)</u>	<u>Tap Size (in.)</u>	<u>DIP</u>	<u>ACP</u>	<u>PVC</u>	<u>STEEL</u>
6	4	CI,SS	CI,SS	CI,SS	SS
8	4	CI,SS	CI,SS	CI,SS	SS

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8	6	CI,SS	CI,SS	SS	SS
10	4	CI,SS	CI,SS	CI,SS	SS
10	6	CI,SS	CI,SS	CI,SS	SS
12	4	CI,SS	CI,SS	CI,SS	SS
12	6	CI,SS	CI,SS	CI,SS	SS
12	8	CI,SS	CI,SS	SS	SS
14 to 24	Up to 10	CI,SS	CI,SS	SS	

- B. Cast iron split sleeves shall have standard mechanical joint ends complying with AWWA C111, except that the mechanical joint glands shall be split to accommodate installation. The outlet shall be flanged with dimensions and drilling that comply with ANSI B16.1, Class 125. The body shall have a 3/8" NPT minimum size test plug. The body shall be coated with corrosion-resistant paint that is compatible with treated water. Cast iron split sleeves shall be Mueller H-615, U.S. Pipe "Tapping Sleeve", Clow F-5205, or approved equal.
  
- C. Stainless steel tapping sleeves, including flanges, outlets, armor plates, lugs, nuts, bolts, and washers shall be constructed of 18-8 type 304 stainless steel. Each sleeve shall be rated at a minimum working pressure of 150 psi and shall be factory hydrostatically tested on a pipe to a minimum of 300 psi for a minimum of three minutes with zero leakage allowed. Certified leak test results shall be provided if required by the Engineer.
  - 1. The sleeves shall incorporate drop-in type bolt lugs with pass-through bolt design and supplied with a minimum of two longer starter-bolts. Sleeves employing lifter bars and/or bolts welded to one half of the sleeve shall not be accepted.
  - 2. Sleeves shall incorporate a full circle, full length, overlapping body gasket made of virgin Buna-N, or equal, compounded for water service. The body gasket may be protected by heavy gauge armor plates at the seams in the sleeve body. The body gasket may be factory bonded to the outlet half of the sleeve and the armor plates shall be factory bonded to the body gasket. The body gasket shall be full thickness between the armor plates and the pipe.
  - 3. The stainless steel flange shall have ANSI 125 lb drilling and be recessed for a tapping valve per MSS-SP60 and furnished with a full-face gasket permanently bonded in place.
  - 4. Sleeves shall be sized properly to fit the pipe outside diameter. The branch outlet shall be oversized to accept standard tapping saws or bits. The outlet shall be furnished with a 3/8" NPT minimum size stainless steel test plug. All welds shall be passivated. All threads shall be factory coated with fluorocarbon to prevent galling. Nylon washers may be added to reduce installation torque.
  - 5. Stainless steel tapping sleeves shall be as manufactured by JCM Industries, Inc. Model JCM 432 or PowerSeal Pipeline Products Corporation Model 3490, or equal.

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**2.4 VALVES**

- A. Valves shall be Type 4 ductile iron resilient wedge tapping gate valves per Section 40 05 23.

**PART 3 EXECUTION**

**3.1 STORAGE AND HANDLING**

- A. Saddles and sleeves used for water main taps shall be stored and handled in their original containers, which shall not be unpacked until 24 hours prior to installation, except for inspection. Saddles and sleeves shall be maintained free from dirt and foreign matter and shall be stored on wooden pallets in their original containers.

**3.2 INSTALLATION OF TAPPING SADDLES**

- A. Installation of saddles shall be in accordance with the manufacturer's recommendations.
- B. The hole drilled or cut in the main shall be equal to the stated nominal size of the threaded tap on the saddle.
- C. Holes cut in PVC water mains shall be accomplished with cutter recommended by the pipe manufacturer. Drills and hole saws not recommended by the pipe manufacturer and are, therefore, prohibited. Cutters shall be advanced slowly and not forced through the pipe wall. Forcing the bit will cause undue heat or fracturing of the PVC material.
- D. Holes cut in DIP water mains may be accomplished by either drilling or the use of a hole saw.
- E. The outside of the pipe shall be cleaned thoroughly of all dirt, grease, oil, and other foreign matter prior to installing the saddle.
- F. Bolts shall be drawn up in an acceptable pattern and torqued to the manufacturer's specifications.

**3.3 INSTALLATION OF TAPPING SLEEVES**

- A. Installation of tapping sleeves shall be in accordance with the manufacturer's recommendations and these specifications. A calibrated torque wrench shall be used to achieve all recommended torques.
- B. After excavating the water main and immediately prior to installing the sleeve, remove all dirt, grease, oil and foreign material from the outside of the water main. The water main shall then be then rinsed thoroughly with water.
- C. Install the tapping sleeve with particular attention to position of gaskets, "O" rings, and seals. Bolts shall be drawn up and torqued to manufacturer's specifications in a uniform and accepted pattern.



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- D. The tapping valve shall be installed on the flange, as recommended by the valve manufacturer.
- E. The downstream flange of the valve shall be blocked temporarily so as to accept the weight of the valve and the tapping machine.
- F. The sleeve and valve installation shall be air tested for leaks prior to installing the tapping machine. The sleeve shall be pressurized with water through the test coupling to at least 100% of the system working pressure at the point of the tap. Care shall be taken to insure that working pressure is maintained in the water main for the duration of the test. The testing equipment shall be fitted with an appropriate gauge. After test pressure is achieved, the complete installation shall be inspected visually for leaks. Then, all joints shall be tested with a solution of soap and water. All visible leaks shall be repaired in a manner approved by the District Engineer. The test pressure shall then be maintained on the gauge without any further aid from the pressure source, for a period of 10 minutes without any perceivable decline in pressure. If the pressure declines, the visual test shall be repeated. The water main shall not be tapped if a leak is present. If the tapping valve is the suspected source of leakage, the valve shall be replaced and the test repeated.
- G. The tap shall be performed in accordance with the tapping machine manufacturer's recommendations. The tapping machine shall be supported and blocked so as to reduce strain on the sleeve, valve, or water main.
- H. The coupon shall be removed with the tapping machine. If, for whatever reason, the coupon is not recovered with the machine, the Contractor shall be responsible for coupon retrieval from the system.
- I. Upon removal of the tapping machine, the entire tapping sleeve and valve assembly shall be inspected for water leaks. All visual leaks shall be repaired. All repair methods shall be subject to Owner approval. The valve shall be opened enough to flush any shavings, chips, and debris from the water main.

**END SECTION**

TAPPING SADDLES SLEEVES AND VALVES  
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TAPPING SADDLES SLEEVES AND VALVES  
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**SECTION 40 05 60**  
**AIR-RELEASE AND VACUUM-RELIEF VALVES**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. This section includes materials and installation of air and vacuum valves, air-release valves, combination air-release valves, slow-closing air and vacuum valves, vacuum-relief valves, and slow-closing combination air-release valves for water and sewage service.

*1.2 RELATED WORK*

- A. Section 09 90 00 – Painting and Coating
- B. Section 40 05 00 – Piping and Fittings

*1.3 REFERENCES*

- A. American Society of Mechanical Engineers (ASME)
- B. American Society for Testing and Materials (ASTM)
- C. American Water Works Association (AWWA)
- D. Food and Drug Administration (FDA)
- E. National Electrical Manufacturers Association (NEMA)
- F. Occupational Safety & Health Administration (OSHA)

*1.4 SUBMITTALS*

- A. Submittals shall be in accordance with the General Conditions and Section 01 33 00.
- B. Submit manufacturer's catalog data and detail drawings showing all valve parts and described by material of construction, specification (such as AISI, ASTM, SAE, or CDA), and grade or type. Show linings and coatings.

*1.5 MATERIALS*

- A. All materials in contact with potable water shall be certified to ANSI/NSF Standard 61.

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**PART 2 PRODUCTS**

*2.1 VALVE IDENTIFICATION*

- A. Valves are identified in the drawings by size, category and type number. For example, a callout in the drawings of a 3/4" Type 1 Air Release Valve refers to a Type 1 Air Release Valve in these specifications, which is a 150-psi 3/4" or smaller air-release valve.

*2.2 VALVE DESIGN-AND OPERATION*

- A. Valve design shall comply with AWWA C512, except as modified herein. Class 150 valves shall have a maximum working pressure of at least 150 psi.
- B. Air-Release Valves for Water Service:
  - 1. Air-release valves for water service 3/4 inch and smaller shall be of the direct-acting type or lever type. Valves larger than 3/4 inch shall have a float-actuated compound lever with linkage mechanism to release air.
  - 2. Air-release valves of sizes 1 and 2 inches shall incorporate a body with flanged top cover and replaceable orifice and a synthetic rubber needle or disc actuated by the float and linkage mechanism. Top cover shall include a 1/2-inch threaded port with bronze plug. Body shall include a 1/2-inch threaded drain port near the bottom with a bronze plug.
- C. Air and Vacuum Valves for Water Service:
  - 1. Air and vacuum valves for water service shall have a body with a flanged top containing the air-release orifice. The float shall rise with the water level in the valve body to close the orifice by sealing against a synthetic rubber seat.
  - 2. Air and vacuum valves 3 inches and smaller shall have 1/2-inch threaded ports with bronze plugs in the top cover and near the bottom of the valve body. Air and vacuum valves larger than 3 inches shall have a 1-inch threaded drain outlet with bronze plug near the bottom of the valve body and a 1-inch threaded port with bronze plug on the side of the valve body above the minimum water level in the valve which forces the float against the valve seat.
- D. Combination air valves 3 inches and smaller shall have a float with lever arm to actuate a poppet valve. A needle shall be attached to the float arm. The poppet valve shall serve to admit large quantities of air when the pipeline drains. The needle shall serve to release small quantities of air as the pipeline fills or as air accumulates in the pipeline.

Combination air valves 4 inches and larger for water service shall consist of an air and vacuum valve with an air-release valve attached to it or integral with it. Connect the attached air-release valve to the air and vacuum valve with standard weight steel piping (ASME B36.10) and an isolation valve if required.

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2.3 MATERIALS OF CONSTRUCTION

- A. Materials of construction for air-release, air and vacuum, and combination air valves for water service shall be as follows:

Item	Material	Specification
Body and cover	Cast iron	ASTM A48, Class 35; or ASTM A126, Class B
Float, lever or linkage, air-release mechanism, poppet, guide rod, guide bushings, fasteners, other internal metal parts	Stainless steel	AISI Type 304
Plugs	Bronze	See paragraph E below
Seat, plunger, needle	Buna-N	–

- B. Materials of construction for diffusers or surge check valves for slow-closing air and vacuum valves shall be as follows:

Item	Material	Specification
Body	Cast iron	ASTM A48, Class 30 or ASTM A126, Class B
Seat, plug, bushing	Bronze	See paragraph E below
Spring, retaining ring, seat retaining ball, fasteners, other internal metal parts	Stainless steel	AISI Type 304
Gasket between diffuser or surge check valve and valve	Cloth-inserted rubber, 1/8 inch thick	Crane Co., Style 777 or equal

- C. Materials of construction for vacuum-relief valves for pipes and tanks shall be as follows:

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Item	Material	Specification
Body	Cast iron	ASTM A126, Class B
Plug	Bronze	ASTM B584, Alloy C83600
Hood	Steel	AISI 1020
Seat	Buna-N	–
Spring	Stainless steel	ASTM A313, Type 302
Seat retaining screws, ring plate bolts and nuts, hood retaining screws, hood washers, other internal metal parts	Stainless steel	AISI Type 304

- D. Rubber seats shall be made of a rubber compound that is resistant to free chlorine and monochloramine concentrations up to 10 mg/L in the fluid conveyed.
- E. Body and cover bolts, nuts, and cap screws shall be carbon steel, ASTM A307.

2.4 VALVE END CONNECTIONS

- A. Valves 3 inches and smaller shall have threaded ends. Valves 4 inches and larger shall have flanged ends.
- B. Flanges for Class 150 valves shall comply with ASME B16.1, Class 125. Threaded ends shall comply with ASME B1.20.1.

2.5 VALVES

- A. Air Release Valves
  - 1. Type 1--Air-Release Valves, 3/4 Inch and Smaller: Valves shall have an operating pressure of 150 psi. Unless otherwise noted on the plans, the orifice sizes shall be 3/32 or 1/8 inch for 1/2-inch valves and 1/8 inch for 3/4-inch valves. Valves shall be APCO Series 50; Val-Matic Model 15A Series or equal.
- B. Air and Vacuum Valves
  - 1. Type 1--Air and Vacuum Valves, 1/2" Through 4 Inches, Class 150: Valves shall be APCO Series 141, Val-Matic Model 100S Series or equal.

- C. Combination Air Valves

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1. Type 1--Combination Air Valves, 1 Through 4 Inches, Class 150: Unless otherwise noted on the plans, the minimum orifice size for the air-release valve shall be 3/16 inch. Combination air-release valves shall be APCO Series 143C, Val-Matic Model 201C Series or equal.

### **PART 3 EXECUTION**

#### **3.1 SERVICE CONDITIONS**

- A. Valves shall seat driptight at the specified seating pressure.

#### **3.2 FACTORY TESTING**

- A. Test each valve per AWWA C512, Section 5 and the following.
- B. Hydrostatically test the pressure-containing parts at the factory with water for 30 minutes minimum at a pressure of 1.5 times the rated pressure but not less than 20 psig. Test shall show zero leakage. If leaks are observed, repair the valve and retest. If dismantling is necessary to correct valve deficiencies, provide an additional operational test per AWWA C512, Section 5 for each affected valve.

#### **3.3 PAINTING AND COATING**

- A. Coat cast-iron valves the same as the adjacent piping. If the adjacent piping is not coated, then coat per Section 09 90 00. Apply the specified prime and intermediate coats at the place of manufacture. Finish coat shall match the color of the adjacent piping.
- B. Coat interior surfaces of cast-iron valves at the place of manufacture per Section 09 90 00. Do not coat seating areas and plastic, bronze, stainless steel, or other high alloy parts.
- C. Alternatively, line and coat valves with fusion-bonded epoxy. Do not coat seating areas and plastic, bronze, stainless steel, or other high alloy parts.

#### **3.4 SHIPMENT AND STORAGE**

- A. Identify the equipment with item and serial numbers and pipeline station. Material shipped separately shall be identified with securely affixed, corrosion-resistant metal tags indicating the item and serial number and project equipment pipeline station or the equipment for which it is intended. In addition, ship crated equipment with duplicate packing lists, one inside and one on the outside of the shipping container.
- B. Pack and ship one copy of the manufacturer's standard installation instructions with the equipment. Provide the instructions necessary to preserve the integrity of the storage preparation after the equipment arrives at the jobsite and before start-up.
- C. Provide flanged openings with metal closures at least 3/16-inch thick, with elastomer gaskets and at least four full-diameter bolts. Provide closures at the place of pump manufacture prior to shipping. For studed openings, use all the nuts needed for the intended service to secure closures.

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- D. Provide threaded openings with steel caps or solid-shank steel plugs. Do not use nonmetallic (such as plastic) plugs or caps. Provide caps or plugs at the place of pump manufacture prior to shipping.
- E. Clearly identify lifting points and lifting lugs on the valves. Identify the recommended lifting arrangement on boxed equipment.

3.5 *INSTALLATION*

- A. Clean flanges by wire brushing before installing flanged valves. Clean flange bolts and nuts by wire brushing, lubricate threads with oil and graphite, and tighten nuts uniformly and progressively. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reseal or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.
- B. Clean threaded joints by wire brushing or swabbing. Apply Teflon® joint compound or Teflon® tape to pipe threads before installing threaded valves. Joints shall be watertight.
- C. Do not use duct tape and plastic for covering the ends of pipe flanges. Use a solid metal cover with rubber gasket to cover flange openings during installation. These metal covers shall remain in place until the piping is connected to the valves.
- D. Do not spring flanges of connecting piping into position. Separately work connecting piping systems into position to bring the piping flanges into alignment with the matching valve flanges. Do not move valves to achieve piping alignment. Do not use electrical heating stress relieving to achieve piping alignment.
- E. Line up pipe flange bolt holes with valve nozzle bolt holes within 1/16 inch maximum offset from the center of the bolt hole to permit insertion of bolts without applying any external force to the piping.
- F. Flange face separation shall be within the gasket spacing  $\pm 1/16$  inch. Use only one gasket per flanged connection.

3.6 *VALVE FIELD PRESSURE TESTING*

- A. Test valves at the same time that the connecting pipelines are pressure tested. See Section 33 01 00 for pressure testing requirements. Protect or isolate any parts of valves, operators, or control and instrumentation systems whose pressure rating is less than the test pressure.

**END SECTION**

AIR-RELEASE AND VACUUM-RELIEF VALVES  
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**SECTION 40 91 25**  
**MAGNETIC FLOW METER**

**PART 1 GENERAL**

*1.1 WORK INCLUDED*

- A. Furnish and install magnetic flow meters with transmitter and power supply at the locations indicated in the Plans.

*1.2 RELATED WORK*

- A. Section 40 05 00 – Piping and Fittings
- B. Section 40 05 23 – Valves and Appurtenances

*1.3 GENERAL*

- A. This unit shall be furnished and installed complete with all anchors and supports; all mechanical and electrical equipment required for proper operation, and all additional materials or construction required by manufacturers design.

*1.4 SERVICE CONDITIONS*

- A. Flow meter shall include the following features as indicated below:

Working pressure, psi	150
Accuracy within flow range, percent	± 0.5

- B. The new flow meters shall be fitted with a transmitter and power supply to provide a 4-20 mA signal to the plant PLC and to the remote indicator.
- C. The new flow meter shall have a rate of flow indicator calibrated in cubic feet per second and a digital totalizer.

*1.5 SUBMITTALS*

- A. Complete data, and detailed drawings of the equipment.
- B. As specified in Section 01 33 00 – Submittals.

*1.6 MATERIALS*

- A. All materials in contact with potable water shall be certified to ANSI/NSF Standard 61.

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**PART 2 PRODUCTS**

**2.1 MAGNETIC FLOW METER**

- A. Meter size and location shall be as shown on the Plans. Meter shall be one of the following, or Engineer approved equivalent:
  - 1. McCrometer Ultra Mag Flowmeter
- B. Meter shall be powered using a manufacturer specified solar panel and battery set up.
- C. The magnetic flow meter shall be a velocity sensing, electromagnetic type, flanged tube meter with a microprocessor-based signal converter and sealed housing.
- D. Meter tube shall rated for 150 psi working pressure and shall be fabricated stainless steel pipe and use 150 lb. AWWA Class "D" flat face steel flanges and PTFE liner. Meter tubes shall have a constant nominal inside diameter offering no obstruction to flow. Electrodes shall be 316 stainless steel.
- E. Provision shall be made for providing a completely sealed environment for all coils, electrode connections, and wiring harnesses, and shall be capable of submerged or buried operation (NEMA 6).
- F. Signal converter shall be, auto zeroing. The signal converter shall mount directly to the meter. The converter shall indicate direction of flow and provide a flow rate indication and a totalization of flow volume for both forward and reverse directions. Both forward and reverse totalizers shall be electronically resettable. The converter shall provide an isolated 4-20 mA output into an 800 ohm load, a frequency output of 0-800 Hz, and a scaled pulse output. The microprocessor-based signal converter shall have a self-diagnostic test mode and a backlit display that continuously displays "Rate of Flow" and "Total Volume." The signal converter configuration parameters shall be lockout protected, but be capable of being changed via the front panel or with the use of a personal computer or electronic organizer with a 9-pin RS-232 serial communications port. The converter shall be compatible with Microsoft Windows or other software with terminal communications capabilities.
  - 1. Converter shall be supplied with a programmable low-flow dropout and empty pipe zero return.
- G. Grounding rings if required shall be 316 stainless steel and shall be supplied with the meter tube.
- H. A blank pipe spool of the same laying length shall be provided to the Owner to place in the piping in the event of the requirement to remove the meter for servicing.

MAGNETIC FLOW METER  
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**PART 3 EXECUTION**

**3.1 INSTALLATION**

- A. Equipment furnished and installed under this section shall be placed in operating condition and, engineering data, unless exceptions are noted by the Engineer.
- B. The new flow meters shall be installed in full conformity with Plans and Specifications as well as the instructions and recommendations of the equipment manufacture.
- C. A factory representative who has complete knowledge of equipment furnished herein shall be provided for at least one (1) four hour period, at equipment start up, to instruct representatives of the Owner and the Engineer on proper operation and maintenance.
- D. Following the completion of installation, the new flow meter shall be tested for proper operation using clean water.
  - 1. At least 2000 gallons shall be passed through the meter during the test. Readings on totalizer shall be recorded to verify accuracy of meter.

**END SECTION**

MAGNETIC FLOW METER  
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MAGNETIC FLOW METER  
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