

**CITY OF GUADALUPE  
CALIFORNIA**



**PIONEER LIFT STATION  
REHABILITATION PROJECT**

**NOTICE TO CONTRACTORS**

**AND**

**SPECIAL PROVISIONS**

**CITY PROJECT NO. 2024-04**



# **PIONEER LIFT STATION REHABILITATION PROJECT**

**MANDATORY PRE-BID MEETING** ..... **10 AM on October 24, 2024**  
**DEADLINE FOR SUBMITTAL OF QUESTIONS:** ..... End of day, November 15, 2024  
**BID OPENING DATE:** ..... 2 PM on November 26, 2024

  
\_\_\_\_\_  
**Jeff van den Eikhof**  
City Engineer

\_\_\_\_\_  
10/01/2024  
**Date**

**LICENSE REQUIREMENT:** ..... **Class A, C34** License at the time of the award.  
**TIME OF CONTRACT:** ..... **135** working days after the date of notice to proceed  
**LIQUIDATED DAMAGES:**..... **\$1,500/day**

For use in connection with the Standard Specifications Dated 2018 and Standard Plans Dated 2018 of the California Department of Transportation, and the Labor Surcharge and Equipment Rental Rates in effect on the date the work is accomplished.

# PIONEER LIFT STATION REHABILITATION PROJECT

**CONTRACT DOCUMENTS,  
SPECIAL PROVISIONS and  
TECHNICAL SPECIFICATIONS**



**Approved By**

A handwritten signature in blue ink, appearing to read "Jeffrey A. van den Eikhof", written over a horizontal line.

10/01/2024

**Jeffrey A. van den Eikhof, City Engineer  
Registered Civil Engineer, C59920**

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**CITY OF GUADALUPE, CA**

**NOTICE INVITING BIDS**

**CITY OF GUADALUPE PROJECT NO. 2024-04**

PROPOSALS FOR THE WORK DESCRIBED AND SHOWN ON THE PLANS ENTITLED:

**PIONEER LIFT STATION REHABILITATION PROJECT**

Will be received at the offices of the Building Department, City of Guadalupe, 918 Obispo Street, Guadalupe, California 93434, until **2:00 PM, November 26, 2024**, at which time they will be publicly opened and read at the same address.

**GENERAL WORK DESCRIPTION:** The work involves the replacement of the Pioneer sewage lift station, the installation of approximately 40 feet of 8-inch gravity sewer pipe, and the installation of approximately 500 feet of 4-inch force main pipe, and other items as specified in the Contract Documents.

**WORK SCHEDULE:** Work must be completed within **135** working days from the Notice to Proceed. Notice to Proceed will be issued 50 weeks after the award of the contract **OR** upon delivery of pump control panels, whichever comes first.

**CONTRACT DOCUMENTS:** Contract documents (Plans, Notice to Contractors, Special Provisions, Proposal, and Sample Contract) or other related information are available for review online at [www.ci.guadalupe.ca.us](http://www.ci.guadalupe.ca.us) and at City Hall, 918 Obispo Street, Guadalupe, California, 93434.

**QUESTIONS:** Questions must be submitted no later than the End of the day, November 15, 2024, to allow sufficient time for response. All questions shall be submitted by email to [jreichmuth@mknassociates.us](mailto:jreichmuth@mknassociates.us).

**MANDATORY PRE-BID MEETING:** A mandatory pre-bid meeting will be held at 10 AM on October 24, 2024, at the Pioneer Lift Station at the corner of 8th Street and Pioneer Street in Guadalupe, CA.

**PROPOSALS:** Proposals must include all work described in the Contract Documents. Proposals must be made on the proposal forms furnished in the Contract Documents. All other proposal forms will be rejected. Attention to prospective bidders is called to Section 2, "Proposal Requirements and Conditions," within the Contract Documents, for full direction as to bidding and other items.

Notice is given to all bidders that no more than 50% of the work, as defined by the contract price, may be done by subcontractors.

Notice is also hereby given that all Bidders may be required to furnish a sworn statement of their financial responsibility, technical ability, and experience before an award is made to any particular Bidder.

The successful Contractor will be required to obtain a business license from the City and pay related fees.

The right is reserved by the City of Guadalupe to reject any or all Bids, to evaluate the Bids submitted, waive any minor irregularities, and award the contract to the lowest responsible Bidder. The City further reserves the right to waive any informalities or minor irregularities in the Bid.

**BONDS:** Each proposal must be accompanied by cash, a certified or cashier's check, or bidder's bond of the prescribed form and made payable to the City of Guadalupe for an amount equal to at least ten percent (10%) of the amount bid, such guaranty to be forfeited, should the bidder to whom the contract is awarded fail to furnish the required bonds and to enter into a contract with the City within ten (10) days after awarding of the contract.

The successful contractor will be required to furnish three (3) acceptable surety bonds: one for faithful performance, one for labor and materials, and the other for maintenance following construction. Each bond is to be executed in a sum equal to one hundred percent (100%) of the contract price except that the maintenance bond shall be for ten

percent (10%) of the contract price and shall remain in effect for one year following acceptance of the project for final payment.

**LICENSE REQUIREMENTS:** In accordance with provisions of California Public Contract Code Section 3300, the City has determined that the **Contractor shall possess a valid Class A, Class C34 license at the time of award.** The Contractor shall be properly licensed at the time the contract is awarded. No contract will be awarded from a Contractor who has not been licensed in accordance with the provisions of Chapter 9 of Division 3 of the Business and Professions Code.

In addition, the following conditions apply:

- No contractor or subcontractor may be listed on a bid proposal for a public works project 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 1777.1(a)]. Proof of the contractor or subcontractor’s current registration to perform public work pursuant to Labor Code section 1725.5 will be required as part of the bid proposal.
- No contractor or subcontractor may be awarded a contract for a public works project 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.

**STANDARD SPECIFICATIONS:** The Standard Specifications for this project are contained in the 2018 edition, including all supplementary documents of the Caltrans Standard Specifications.

**PREVAILING WAGE RATES:** Pursuant to Section 1773 of the Labor Code, the general prevailing wage rates in the County of Santa Barbara, in which the work is to be done, has been determined by the Director of the California Department of Industrial Relations in accordance with Section 1770 of the Labor Code. These wages are set forth in the General Prevailing Wage Rates for this project, available from the California Department of Industrial Relations’ Internet web site at <http://www.dir.ca.gov>.

Future effective general prevailing wage rates, which have been predetermined and are on file with the California Department of Industrial Relations, are referenced but not printed in the general prevailing wage rates.

The Contractor will be required to maintain and distribute certified payroll records in compliance with Section 1776 of the California Labor Code.

**RETENTION:** Five (5) percent of the invoiced amount shall be retained until 30 calendar days after the Notice of Completion is recorded by the County of Santa Barbara. The Contractor may elect to receive 100 percent of payments due under the Contract Documents from time to time, without retention from any portion of the payment by the City, by depositing securities of equivalent value with the City in accordance with the provisions of Section 22300 of the California Public Contract Code. Such securities, if deposited by the Contractor, shall be valued by the City, whose decision on an evaluation of the securities shall be final. Securities eligible for investment under this provision shall be limited to those listed in Section 22300 and Section 16430 of the California Government Code.

Dated at City of Guadalupe, County of Santa Barbara, California this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_.

By

\_\_\_\_\_  
City Clerk  
City of Guadalupe, CA

**PROPOSAL**  
**TO**  
**THE CITY OF GUADALUPE**  
**FOR**  
**PIONEER LIFT STATION REHABILITATION PROJECT**  
**CITY PROJECT NO. 2024-04**

NAME OF BIDDER \_\_\_\_\_

BUSINESS P.O. BOX \_\_\_\_\_

CITY, STATE, ZIP \_\_\_\_\_

BUSINESS STREET ADDRESS \_\_\_\_\_

CITY, STATE, ZIP \_\_\_\_\_

TELEPHONE NO.: \_\_\_\_\_

FAX NO.: \_\_\_\_\_

EMAIL ADDRESS: \_\_\_\_\_

LICENSE NUMBER AND TYPE: \_\_\_\_\_

DIR NUMBER: \_\_\_\_\_

The work for which this Proposal is submitted is for construction in accordance with the Special Provisions (including the payment of not less than the State General Prevailing Wage Rates or the Federal minimum wage rates when set forth herein), the Plans described below, including any addenda thereto, the contract annexed hereto, and also in accordance with the Caltrans Standard Specifications dated 2018, and the City of Santa Maria Standard Specifications (adopted by the City of Guadalupe on June 23, 2009, pursuant to Resolution No. 2009-24) insofar as the same may apply, specifications which may be referred to in the Special Provisions or project plans, and the Labor Surcharge And Equipment Rental Rates in effect on the date the work is accomplished.

The Technical Specifications for the work to be done are entitled:

**CITY OF GUADALUPE, CALIFORNIA;**  
**PIONEER LIFT STATION REHABILITATION PROJECT**

The Bidder's attention is directed to Section 2, "Proposal Requirements and Conditions," of the Contract Documents.

The undersigned as Bidder declares that he/she has carefully examined the location of the proposed work above described, read and examined the Contract Documents, and Addendum/Addenda (List Addenda Received: \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_) therefore, read the Notice to Contractors, the Proposal Requirements, including the Caltrans Standard Specifications, and hereby proposes and agrees, if this Proposal is accepted by the City, to furnish all materials and services required to do all the work required to complete the said construction in accordance with the Contract Documents in the time stated herein, for the unit prices given below:

### BID SCHEDULE

ITEM NO.	BID ITEMS	PAYMENT REFERENCE *TS 012000	TOTAL QUANTITIES	UNIT	UNIT PRICE	TOTAL COST
<b>BASE BID</b>						
1	Mobilization	TS-1.04	1	LS		
2	Sheeting, Shoring, Bracing, and Excavation Safety Measures	TS-1.05	1	LS		
3	Temporary Bypassing	TS-1.06	1	LS		
4	Traffic Control	TS-1.07	1	LS		
5	Lift Station	TS-1.08	1	LS		
6	Sitework	TS-1.09	1	LS		
7	Discharge Manhole	TS-1.10	1	LS		
8	4-inch C900 PVC Force Main	TS-1.11	494	LF		
9	8-inch SDR 35 PVC Gravity Sewer	TS-1.12	32	LF		
10	Electrical and Controls	TS-1.13	1	LS		
11	Demolition	TS-1.14	1	LS		
12	Pavement Rehabilitation – Trench Section	TS-1.15	1,976	SF		
13	Pavement Rehabilitation – Caltrans ROW Overlay	TS-1.16	2,709	SF		
<b>TOTAL BASE BID (ITEMS 1 THROUGH 13)</b>						

\*TS = Technical Specifications (Section 10)

TOTAL BASE BID IN WORDS:

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Total Base Bid Amount shall be shown in both words and figures.

The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. Bids will be compared by the Total Mathematical Bid as determined by the Engineer. The Total Mathematical Bid is the summation of all required bid items, excluding bid alternates. Bid items are calculated by multiplying the Engineers Estimate quantities by the unit bid prices. In the case of a discrepancy between the Total Mathematical Bid and the total bid written above, the Total Mathematical Bid shall govern.

The bidder to whom the contract is awarded agrees to enter into a contract with the City of Guadalupe within **fifteen (15) days** after the date of the Notice of Award, and to commence work within **ten (10) working days** after the date of the Notice To Proceed, and to diligently prosecute the work to completion within the Time of Contract shown on the cover of the Project Manual. The City will issue the Notice to Proceed **fifty (50) weeks** after the contract award **or** upon delivery of the pump control panels, whichever comes first.

The undersigned understands and agrees that the City of Guadalupe will not be responsible for any errors or omissions on the part of the undersigned in preparing and submitting this Proposal.

---

Signature

---

Title

---

Date

**LIST OF SUBCONTRACTORS**

**PIONEER LIFT STATION REHABILITATION PROJECT**

Pursuant to Section 4100 of the Public Contracts Code and section 2-1.10 of the standard specifications, the Bidder is required to furnish the following information for each Subcontractor performing more than 1/2 percent (0.5%) of the total base bid. Do not list alternative subcontractors for the same work. Subcontracting must not total more than fifty percent (50%) of the submitted bid except as allowed in Section 5-1.13A of the standard specifications.

For Streets & Highways projects, subcontractors performing less than ten thousand dollars (\$10,000) worth of work need not be mentioned. Subcontractors must be registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5 to be listed.

**NOTE: If there are no subcontractors, write "NONE" and submit with bid.**

Name Under Which Subcontractor is Licensed	License Number / DIR Number	Address and Phone Number of Office, Mill or Shop	Specific Description of Subcontract	% of Total Base Bid
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
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_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

NOTE: This form may be reproduced and attached behind this page to list more subcontractors.

## **PUBLIC CONTRACT CODE**

### **Public Contract Code Section 10285.1 Statement**

In conformance with Public Contract Code Section 10285.1 (Chapter 376, Stats. 1985), the bidder hereby declares under penalty of perjury under the laws of the State of California that the bidder has \_\_\_\_, has not \_\_\_\_ been convicted within the preceding three years of any offenses referred to in that section, including any charge of fraud, bribery, collusion, conspiracy, or any other act in violation of any state or Federal antitrust law in connection with the bidding upon, award of, or performance of, any public works contract, as defined in Public Contract Code Section 1101, with any public entity, as defined in Public Contract Code Section 1100, including the Regents of the University of California or the Trustees of the California State University. The term "bidder" is understood to include any partner, member, officer, director, responsible managing officer, or responsible managing employee thereof, as referred to in Section 10285.1.

**Note:** The bidder must place a checkmark after "has" or "has not" in one of the blank spaces provided. The above Statement is part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.

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### **Public Contract Code Section 10162 Questionnaire**

In conformance 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 a 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 following space.



## **PUBLIC CONTRACT CODE 10232 STATEMENT**

In conformance 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 of 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.

Note: The above Statement and Questionnaire are part of the Proposal. Signing this Proposal on the signature portion thereof shall also constitute signature of this Statement and Questionnaire.

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

---

## CONTRACTOR'S LICENSING STATEMENT

I declare under penalty of perjury under the laws of the State of California that the following is true and correct. Executed in the City of Guadalupe this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_.

The undersigned is licensed in accordance with the laws of the State of California providing for the registration of the Contractors, License No. \_\_\_\_\_, Expiration Date \_\_\_\_\_.

Business Name (DBA): \_\_\_\_\_

Owner/Legal Name: \_\_\_\_\_

Indicate One:    Sole-proprietor     Partnership     Corporation

List Partners/Corporate Officers:

Name	Title
------	-------

Name	Title
------	-------

Name	Title
------	-------

Name	Title
------	-------

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

City, State, ZIP Code \_\_\_\_\_

Mailing Address: \_\_\_\_\_

City, State, ZIP Code \_\_\_\_\_

Phone Number: \_\_\_\_\_

Fax Number: \_\_\_\_\_

Email Address: \_\_\_\_\_

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

Signature of Bidder \_\_\_\_\_

\_\_\_\_\_  
(Print Name and Title of Bidder)

**WORKERS' COMPENSATION INSURANCE CERTIFICATE**

The Contractor shall execute the following form as required by the California Labor Code, Section 1861:

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.

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

\_\_\_\_\_  
(Contractor)

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Title)

Attest:

By: \_\_\_\_\_  
(Signature)

By: \_\_\_\_\_  
(Title)

**BIDDER'S BOND**

We, \_\_\_\_\_  
\_\_\_\_\_ as Principal, and  
\_\_\_\_\_

as Surety are bound unto the City of Guadalupe, State of California, hereafter referred to as "Obligee", in the penal sum of ten percent (10%) of the total amount of the bid of the Principal submitted to the Obligee for the work described below, for the payment of which sum we bind ourselves, our heirs, executors and administrators, successors or assigns, jointly and severally,

**THE CONDITION OF THIS OBLIGATION IS SUCH, THAT:**

WHEREAS, the Principal is submitted to the Obligee, for the PIONEER LIFT STATION REHABILITATION PROJECT

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

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

Dated: \_\_\_\_\_, 20\_\_.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
*Principal*  
\_\_\_\_\_  
*Surety*  
By \_\_\_\_\_  
*Attorney-in-fact*

**CERTIFICATE OF ACKNOWLEDGEMENT**

State of California  
City/County of \_\_\_\_\_ SS

On this \_\_\_\_\_ day of \_\_\_\_\_ in the year 20\_\_ before me  
\_\_\_\_\_, personally appeared \_\_\_\_\_,  
*Attorney-in-fact*

personally known to me (or proved to me on the basis of satisfactory evidence) to be the person whose name is subscribed to this instrument as the attorney-in-fact of \_\_\_\_\_, and acknowledged to me that he (she) subscribed the name of the said company thereto as surety, and his (her) own name as attorney-in-fact.

(SEAL) \_\_\_\_\_  
*Notary Public*

**NOTE:** At the discretion of the City the low and second low bidders may be required to complete and return the "Contractor's and Subcontractor's Statement Of Experience and Financial Condition" forms provided herein prior to determination regarding bid award.

**CONTRACTOR'S AND SUBCONTRACTOR'S  
STATEMENT OF EXPERIENCE AND FINANCIAL CONDITION**

1. Name: \_\_\_\_\_  A Corporation  
 \_\_\_\_\_  A Co-Partnership  
 \_\_\_\_\_  An Individual  
 \_\_\_\_\_  Combination  
 (Name Must Correspond with Contractor's License In Every Detail)

2. Principal Office: \_\_\_\_\_  
 (Street and P.O. Box) (City) (State) (Zip Code)

3. Telephone (\_\_\_\_\_) \_\_\_\_\_

The Signatory of this questionnaire guarantees the truth and accuracy of all statements and of all answers to interrogatories hereinafter made.

NOTE: When the word "you" or "your" is used herein, it shall mean you, your firm, your corporate officers, partners, principals or proprietors.

4. Names of Corporate Officers, Partners, Principals, Proprietors:

<u>NAME</u>	<u>POSITION</u>	<u>PERCENTAGE OF STOCK</u>

5. List Any Subsidiaries or Affiliated Companies:

<u>EXACT NAME</u>	<u>TYPE OF BUSINESS</u>	<u>OWNERSHIP</u>

6. Name, Address, and Telephone No. of Bank:

Total Line of Credit	How Secured	Interest Rate
\$ _____		_____

7. How much of your line of credit is currently available? \$ \_\_\_\_\_

8. Name of Loan Officer: \_\_\_\_\_

(List additional bank(s) on next page, if applicable)

9. Are you licensed as a Contractor to do business in California?

Yes \_\_\_ No \_\_\_ License No. \_\_\_\_\_ Type

Classification (Type) of Specialty Contractor

10. How many years has your organization been in business as a contractor under your present business name and license number? \_\_\_\_\_ years.

11. How many years' experience in \_\_\_\_\_ construction work has your organization had?

12. Has your firm or any of its principals ever petitioned for bankruptcy? \_\_\_\_\_ If answer is "Yes," enter the date(s)

13. Has your firm or any of its principals defaulted so as to cause a loss to surety? If the answer is "Yes," enter the date(s), name and address of surety and details.

14. Show the projects (10 maximum) your organization has completed during the last three years in the following tabulation; be specific as to the nature of the work your firm actually performed.

(Use as many spaces as required to complete your answer)

YEAR COMPLETED	TYPE OF WORK (be specific)	VALUE OF WORK PERFORMED	CITY AND STATE CONTACT PERSON/PHONE


**15.** Have you been assessed liquidated damages for any project in the past three years?

If yes, explain.

**16.** Have you been in litigation on a question relating to your performance on a contract during the past three years? \_\_\_\_ If yes, explain.

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**17.** Have you failed to complete a contract? \_\_\_\_\_. If so, give details:

---



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18. In what other lines of business pertaining to this Statement do you have a financial interest?

---



---



---

19. Name the persons with whom you have been associated in business as partners or joint venture in each of the last five years.

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20. What is the construction experience of the principal individuals of your present organization?

Individual's Name	Present Position or Office In Your Organization	Years of Construction Experience	Magnitude and Type of Work

21. List 10 subcontractors with whom you have worked in the last two years:

NAME	ADDRESS	TELEPHONE



NAME	ADDRESS	TELEPHONE

22. List the names of three Architects or Engineers whose jobs you have worked on in the past two years:

Name of Architect Or Engineer	Telephone

23. Please attach a balance sheet and profit and loss statement prepared by a Certified Public Accountant or a Public Accountant.

24. List and explain all contingent liabilities. \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

25. Explain any Stop Notice(s) filed against you in the past three years.

Date	By Whom	How Resolved	Why Filed

List your five major suppliers of equipment, supplies and materials:

NAME	ADDRESS

## FAITHFUL PERFORMANCE BOND

WHEREAS, the City Council of the City of Guadalupe, State of California, and \_\_\_\_\_ (hereinafter designated as the "principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated \_\_\_\_\_, 20\_\_\_\_\_, and identified as PIONEER LIFT STATION REHABILITATION PROJECT, is hereby referred to and made a part hereof; and

WHEREAS, said principal is required under the terms of said agreement to furnish a bond for the faithful performance of said agreement.

NOW, therefore, we, the principal and \_\_\_\_\_, as surety, are held and firmly bound unto the City of Guadalupe hereinafter called "City," in the penal sum of \_\_\_\_\_ Dollars (\$\_\_\_\_\_) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors, administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounded principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and provisions in the said agreement and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless City, its officers, agents, and employees as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed there under or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by principal and surety above named, on \_\_\_\_\_, 20\_\_\_\_.

APPROVED AS TO FORM:

By: \_\_\_\_\_  
City Attorney

ADDRESS OF CONTRACTOR FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDER-TAKING LAW:

\_\_\_\_\_  
Principal (SEAL)

\_\_\_\_\_  
(SEAL)

\_\_\_\_\_  
Signature of Principal Title

ADDRESS OF SURETY FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW

\_\_\_\_\_  
(SEAL)

\_\_\_\_\_  
Surety (SEAL)

\_\_\_\_\_  
Signature for Surety Title

**LABOR AND MATERIAL BOND**

WHEREAS, the City Council of the City of Guadalupe, State of California and \_\_\_\_\_ (hereinafter designated as "principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated \_\_\_\_\_, 20\_\_, and identified as PIONEER LIFT STATION REHABILITATION PROJECT, is hereby referred to and made a part hereof; and

WHEREAS, under the terms of said agreement, principal is required before entering upon the performance of the work, to file a good and sufficient payment bond with the City of Guadalupe to secure the claims to which reference is made in Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code of the State of California.

NOW, THEREFORE, said principal and the undersigned as corporate surety, are held firmly bound unto the City of Guadalupe and all contractors, subcontractors, laborers, material, men and other persons employed in the performance of the aforesaid agreement and referred to in the aforesaid Code of Civil Procedure in the sum\_of \_\_\_\_\_ Dollars (\$ \_\_\_\_\_), for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to such work or labor, that said surety will pay the same in amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this bond shall inure to the benefit of any and all persons, companies and corporations entitled to file claims under Title 15 (commencing with Section 3082) of Part 4 of Division 3 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this bond.

Should the condition of this bond be fully performed, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of said agreement or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension, alteration or addition.

IN WITNESS WHEREOF, this instrument has been duly executed by the principal and surety above named, on \_\_\_\_\_, 20\_\_.

APPROVED AS TO FORM:

By: \_\_\_\_\_  
City Attorney

ADDRESS OF CONTRACTOR FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW:

\_\_\_\_\_  
Principal (SEAL)

\_\_\_\_\_  
(SEAL)

\_\_\_\_\_  
Signature of Principal Title

ADDRESS OF SURETY FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW

\_\_\_\_\_  
(SEAL)

\_\_\_\_\_  
Surety (SEAL)

\_\_\_\_\_  
Signature for Surety Title

## GUARANTEE AND DEFECTIVE MATERIAL BOND

WHEREAS, the City Council of the City of Guadalupe, State of California and \_\_\_\_\_ (hereinafter designated as "principal") have entered into an agreement whereby principal agrees to install and complete certain designated public improvements, which said agreement, dated \_\_\_\_\_, 20\_\_\_\_, and identified as PIONEER LIFT STATION REHABILITATION PROJECT, is hereby referred to and made a part hereof; and

WHEREAS, said principal is required under the terms of said agreement to furnish a bond for the one-year maintenance of public improvements of said agreement.

NOW, therefore, we, the principal and \_\_\_\_\_, as surety, are held and firmly bound unto the City of Guadalupe hereinafter called "City," in the penal sum of \_\_\_\_\_ dollars (\$\_\_\_\_\_) lawful money of the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors, executors and administrators, jointly and severally, firmly by these presents.

The condition of this obligation is such that if the above bounded principal, his or its heirs, executors, administrators, successors, or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and provisions in the said agreement and any alteration thereof made as therein provided, on his or their part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless City, its officers, agents, and employees as therein stipulated, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefore, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by City in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered.

The surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed there under or the specifications accompanying the same shall in any manner affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

IN WITNESS WHEREOF, this instrument has been duly executed by the principal and surety above named, on \_\_\_\_\_, 20\_\_\_\_.

ADDRESS OF CONTRACTOR FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDER-TAKING LAW:

\_\_\_\_\_  
Principal (SEAL)

\_\_\_\_\_  
(SEAL)

\_\_\_\_\_  
Signature of Principal Title

ADDRESS OF SURETY FOR SERVICE OF DOCUMENTS UNDER BOND AND UNDERTAKING LAW

\_\_\_\_\_  
(SEAL)

\_\_\_\_\_  
Surety (SEAL)

\_\_\_\_\_  
Signature for Surety Title



**SAMPLE AGREEMENT**  
**AGREEMENT FOR CONTRACTOR SERVICES**  
**BETWEEN**  
**THE CITY OF GUADALUPE**  
**AND**

THIS AGREEMENT FOR CONTRACTOR SERVICES (the "Agreement") is made and entered into this \_\_\_ day of \_\_\_\_\_ 20xx, by and between the CITY OF GUADALUPE, a municipal corporation ("City") and, \_\_\_\_\_ a California \_\_\_\_\_ ("Contractor").

In consideration of the mutual covenants and conditions set forth herein, the parties agree as follows:

Section 1. Term of Agreement. Subject to the provisions of Section 19 (Termination of Agreement) of this Agreement, the term of this Agreement shall be for a period of one (1) year from the date of execution of this Agreement, as first shown above. Such term may be extended upon written agreement of both parties to this Agreement.

Section 2. Scope of Services. Contractor agrees to perform the services set forth in Exhibit A (Scope of Services) and made a part of this Agreement.

Section 3. Additional Services. Contractor shall not be compensated for any services rendered in connection with its performance of this Agreement which are in addition to or outside of those set forth in this Agreement or listed in Exhibit A unless such additional services are authorized in advance and in writing by the City Council or City Administrator of City. Contractor shall be compensated for any such additional services in the amounts and in the manner agreed to by the City Council or City Administrator.

Section 4. Compensation and Method of Payment.

(a) Subject to any limitations set forth in this Agreement, City agrees to pay Contractor the amounts specified in Exhibit A (Compensation) and made a part of this Agreement.

(b) Each month Contractor shall furnish to City an original invoice for all work performed and expenses incurred during the preceding month. The invoice shall detail charges by the following categories: labor (by subcategory), travel, materials, equipment, supplies, sub-contractor contracts and miscellaneous expenses. City shall independently review each invoice submitted by Contractor to determine whether the work performed and expenses incurred are in compliance with the provisions of this Agreement and Scope of Services. In the event that no charges or expenses are disputed, the invoice shall be approved and paid according to the terms set forth in subsection (c). In the event City disputes any charges or expenses, City shall return the original invoice to Contractor

with specific items in dispute identified for correction and re-submission. All undisputed charges shall be paid in accordance with this Agreement and Scope of Services.

(c) Except as to any charges for work performed or expenses incurred by Contractor, which are disputed by City, City will cause Contractor to be paid within thirty (30) days of receipt of Contractor's invoice.

(d) Payment to Contractor for work performed pursuant to this Agreement shall not be deemed to waive any defects in work performed by Contractor.

(e) Contractor shall have the right to suspend services if not paid in accordance with this Agreement.

Section 5. Inspection and Final Acceptance. City may inspect and accept or reject any of Contractor's work under this Agreement, either during performance or when completed, if the work is found to be defective or not in compliance with the defined Scope of Services. Acceptance of any of the Contractor's work by City shall not constitute a waiver of any of the provisions of this Agreement, including but not limited to, Sections 15 and 16, pertaining to indemnification and insurance, respectively. Contractor agrees to cooperate in any such inspection.

Section 6. Ownership of Documents. All original maps, models, designs, drawings, photographs, studies, surveys, reports, data, notes, computer files, files and other documents prepared, developed or discovered by Contractor in the course of providing any services pursuant to this Agreement shall become the sole property of City and may be used, reused or otherwise disposed of by City without the permission of the Contractor. Reuse of any materials outside the scope of this Agreement shall be at the sole risk of the City.

#### Section 7. Contractor's Books and Records.

(a) Contractor shall maintain any and all documents and records demonstrating or relating to Contractor's performance of services pursuant to this Agreement. Contractor shall maintain any and all ledgers, books of account, invoices, vouchers, canceled checks, or other documents or records evidencing or relating to work, services, expenditures and disbursements charged to City pursuant to this Agreement. Any and all such documents or records shall be maintained in accordance with generally accepted accounting principles and shall be sufficiently completed and detailed so as to permit an accurate evaluation of the services provided by Contractor pursuant to this Agreement. Any and all such documents or records shall be maintained for three (3) years from the date of execution of this Agreement and to the extent required by laws relating to the audits of public agencies and their expenditures.

(b) Any and all records or documents required to be maintained pursuant to this section shall be made available for inspection, audit and copying, upon reasonable notice during regular business hours, upon written request by City or its designated representative. Copies of such documents or records shall be provided directly to the City for inspection, audit and copying when it is practical to do so; otherwise, unless an

alternative is mutually agreed upon, such documents and records shall be made available at Contractor's address indicated for receipt of notices in this Agreement. The City shall compensate the Contractor for all costs associated with providing these materials to the City.

(c) Where City has reason to believe that any of the documents or records required to be maintained pursuant to this section may be lost or destroyed due to dissolution or termination of Contractor's business, City may, by written request, require that custody of such documents or records be given to the requesting party and that such documents and records be maintained by the requesting party. Access to such documents and records shall be granted to City, as well as to its successors-in-interest and authorized representatives.

#### Section 8. Status of Contractor.

(a) Contractor is and shall at all times during the terms of this Agreement remain a wholly independent Contractor and not an officer, employee or agent of City. Contractor shall have no authority to bind City in any manner, nor to incur any obligation, debt or liability of any kind on behalf of or against City, whether by contract or otherwise, unless such authority is expressly conferred under this Agreement or is otherwise expressly conferred in writing by City.

(b) The personnel performing the services under this Agreement on behalf of Contractor shall at all times be under Contractor's exclusive direction and control. Neither City nor any elected or appointed boards, officers, officials, employees or agents of City, shall have control over the conduct of Contractor or any of Contractor's officers, employees or agents, except as set forth in this Agreement. Contractor shall not at any time or in any manner represent that Contractor or any of Contractor's officers, employees or agents are in any manner officials, employees or agents of City.

(c) Neither Contractor nor any of Contractor's officers, employees or agents shall obtain any rights to retirement, health care or any other benefits which may otherwise accrue to City's employees. Contractor expressly waives any claim Contractor may have to any such rights.

Section 9. Standard of Performance. Contractor represents and warrants that it has the qualifications, experience and facilities necessary to properly perform the services required under this Agreement in a thorough, competent and professional manner. Contractor shall at all times faithfully, competently and to the best of its ability, experience and talent, perform all services described herein. In meeting its obligations under this Agreement, Contractor shall employ, at a minimum, generally accepted standards and practices utilized by persons engaged in providing services similar to those required of Contractor under this Agreement.

Section 10. Compliance With Applicable Laws, Permits and Licenses. Contractor shall keep itself informed of and comply with all applicable federal, state and local laws, statutes, codes, ordinances, regulations and rules in effect during the term of this

Agreement applicable to Contractor. Contractor shall obtain any and all licenses, permits and authorizations necessary to perform the services set forth in this Agreement. Neither City, nor any elected or appointed boards, officers, officials, employees or agents of City, shall be liable at law or in equity as a result of any failure of Contractor to comply with this section.

Section 11. Nondiscrimination. Contractor shall not discriminate, in any way, against any person on the basis of race, color, religious creed, national origin, ancestry, sex, age, disability, marital status or sexual orientation in connection with or related to the performance of this Agreement.

Section 12. Unauthorized Aliens. Contractor hereby promises and agrees to comply with all of the provisions of the Federal Immigration and Nationality Act, 8 U.S.C.A. sections 1101, et seq., as amended, and in connection therewith, shall not employ unauthorized aliens for the performance of work and/or services covered by this Agreement, and should any liability or sanctions be imposed against City for such use of unauthorized aliens, Contractor hereby agrees to and shall reimburse City for the cost of all such liabilities or sanctions imposed, together with any and all costs, including attorney's fees, incurred by City.

Section 13. Conflicts of Interest. Contractor will comply with all conflict of interest laws and regulations including, without limitation, the City's Conflict of Interest Code (on file in the City Clerk's Office). All officers, employees and/or agents of Contractor who will be working on behalf of the City pursuant to this Agreement, may be required to file Statements of Economic Interest. Therefore, it is incumbent upon the Contractor or Contracting firm to notify that City of any staff changes relating to this Agreement.

A. In accomplishing the scope of services of this Agreement, all officers, employees and/or agents of Contractor(s), unless as indicated in Subsection B, will be performing a very limited and closely supervised function, and, therefore, unlikely to have a conflict of interest arise. No disclosures are required for any officers, employees, and/or agents of Contractor, except as indicated in Subsection B.

B. In accomplishing the scope of services of this Agreement, Contractor(s) will be performing a specialized or general service for the City, and there is substantial likelihood that the Contractor's work product will be presented, either written or orally, for the purpose of influencing a governmental decision. As a result, the following Contractor(s) shall be subject to Disclosure Category "1" of the City's Conflict of Interest Code.

#### Section 14. Confidential Information; Release of Information.

(a) All information gained or work product produced by Contractor in performance of this Agreement shall be considered confidential, unless such information is in the public domain or already known to Contractor. Contractor shall not release or disclose any such information or work product to persons or entities other than City without prior written authorization from the City Administrator, except as may be required by law.

(b) Contractor, its officers, employees, agents or subcontractors, shall not, without prior written authorization from the City Administrator or unless requested by the City Attorney of City, voluntarily provide declarations, letters of support, testimony at depositions, responses to interrogatories or other information concerning the work performed under this Agreement. A response to a subpoena or court order shall not be considered "voluntary" provided Contractor gives City notice of such court order or subpoena.

(c) If Contractor, or any officer, employee, agent or subcontractor of Contractor, provides any information or work product in violation of this section, then City shall have the right to reimbursement and indemnity from Contractor for any damages, costs and fees, including attorney's fees, caused by or incurred as a result of Contractor's conduct.

(d) Contractor shall promptly notify City should Contractor, its officers, employees, agents or sub contractors be served with any summons, complaint, subpoena, notice of deposition, request for documents, interrogatories, request for admissions or other discovery request, court order or subpoena from any party regarding this Agreement and the work performed thereunder. City retains the right, but has no obligation, to represent Contractor or be present at any deposition, hearing or similar proceeding. Contractor agrees to cooperate fully with City and to provide City with the opportunity to review any response to discovery requests provided by Contractor. However, this right to review any such response does not imply or mean the right by City to control, direct, or rewrite said response. Contractor shall be compensated for all costs associated with complying with this section.

#### Section 15. Indemnification.

(a) City and its respective elected and appointed boards, officials, officers,

agents, employees and volunteers (individually and collectively, "Indemnitees") shall have no liability to Contractor or any other person for, and Contractor shall indemnify, defend, protect and hold harmless Indemnitees from and against, any and all liabilities, claims, actions, causes of action, proceedings, suits, damages, judgments, liens, levies, costs and expenses of whatever nature, including reasonable attorney's fees and disbursements (collectively, "Claims") which Indemnitees may suffer or incur or to which Indemnitees may become subject by reason of or arising out of any injury to or death of any person(s), damage to property, loss of use of property, economic loss or otherwise occurring as a result of or allegedly caused by Contractor's performance of or failure to perform any services under this Agreement or by the negligent or willfully wrongful acts or omissions of Contractor, its agents, officers, directors, sub contractors or employees, committed in performing any of the services under this Agreement.

(b) If any action or proceeding is brought against Indemnitees by reason of any of the matters against which Contractor has agreed to indemnify Indemnitees as provided above, Contractor, upon notice from City, shall defend Indemnitees at Contractor's expense by counsel acceptable to City, such acceptance not to be unreasonably withheld. Indemnitees need not have first paid for any of the matters to which Indemnitees are entitled to indemnification in order to be so indemnified. The insurance required to be maintained by Contractor under Section 16 shall ensure Contractor's obligations under this section, but the limits of such insurance shall not limit the liability of Contractor hereunder. The provisions of this section shall survive the expiration or earlier termination of this Agreement.

(c) The provisions of this section do not apply to Claims occurring as a result of the City's sole negligence or willfully wrongful acts or omissions.

(d) City agrees to indemnify Contractor for any such neglect or willfully wrongful acts committed by City or its officers, agents or employees.

Section 16. Insurance. Contractor agrees to obtain and maintain in full force and effect during the term of this Agreement, insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work provided by Contractor, its agents, representatives or employees in performance of this Agreement. Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII. All insurance policies shall be subject to approval by City as to form and content. These requirements are subject to amendment or waiver, if so approved in writing by City Administrator. Contractor agrees to provide City with copies of required policies upon request. Prior to the beginning of and throughout the duration of the Work, Contractor and its subcontractors shall maintain insurance in conformance with the requirements set forth below. Contractor will use existing coverage to comply with these requirements. If that existing coverage does not meet the requirements set forth herein, Contractor agrees to amend, supplement or endorse the existing coverage to do so. Contractor acknowledges that the insurance coverage and policy limits set forth in this section constitute the minimum amount of coverage required. Any insurance proceeds available to Contractor or its subcontractors in excess of the limits and coverage identified in this Agreement and which is applicable to a given loss, claim or demand, will be equally available to CITY.

Contractor shall provide the following types and amounts of insurance. Without limiting Contractor's indemnification of CITY, and prior to commencement of Work, Contractor shall obtain, provide and maintain at its own expense during the term of this Agreement, policies of insurance of the type and amounts described below and in a form satisfactory to CITY:

A. Minimum Scope of Insurance: Coverage shall be at least as broad as:

(1) Insurance Services Office Form Commercial General Liability coverage (Occurrence Form CG 0001).

(2) Insurance Services Office Form No. CA 0001 covering Automobile Liability, including code 1"any auto" and endorsement CA 0025, or equivalent forms subject to written approval of City.

(3) Workers' Compensation insurance as required by the Labor Code of the State of California and Employers' Liability insurance and covering all persons providing services on behalf of the Contractor and all risks to such persons under this Agreement, along with a waiver of subrogation endorsement.

(4) Errors and omission liability insurance appropriate to the Contractor's profession.

B. Minimum Limits of Insurance: Contractor shall maintain limits of insurance no less than:

(1) General Liability Insurance: Contractor shall maintain commercial general liability insurance with coverage at least as broad as Insurance Services Office form CG 00 01, in an amount not less than \$1,000,000 per occurrence, \$2,000,000 general aggregate, for bodily injury, personal injury, and property damage, and a \$2,000,000 completed operations aggregate. The policy shall provide or be endorsed to provide that CITY and its officers, officials, employees, agents, and volunteers shall be additional insureds under such policies. This provision shall also apply to any excess/umbrella liability policies. The policy must include contractual liability that has not been amended. Any endorsement restricting standard ISO "insured contract" language will not be accepted. This insurance and any umbrella or excess liability insurance shall be maintained for a minimum of three years or as long as there is a statutory exposure to completed operations claims, with the City and its officers, officials, employees, and agents continued as additional insured.

(2) Automobile Liability: Contractor shall maintain automobile insurance at least as broad as Insurance Services Office form CA 00 01 covering bodily injury and property damage for all activities of the Contractor arising out of or in connection with Work to be performed under this Agreement, including coverage for any owned, hired, non-owned or rented vehicles, in an amount not less than \$1,000,000 combined single limit for each accident.

(3) Workers' Compensation and Employer's Liability: Contractor shall maintain Workers' Compensation Insurance (Statutory Limits) and Employer's Liability Insurance (with

limits of at least \$1,000,000) for Contractor's employees in accordance with the laws of the State of California, Section 3700 of the Labor Code. In addition, Contractor shall require each subcontractor to similarly maintain Workers' Compensation Insurance and Employer's Liability Insurance in accordance with the laws of the State of California, Section 3700 for all of the subcontractor's employees. Contractor shall submit to CITY.

(4) Errors and Omissions Liability: \$1,000,000 per claim as appropriate for the profession.

(5) Umbrella or excess liability insurance (if needed): Contractor shall obtain and maintain an umbrella or excess liability insurance that will provide bodily injury, personal injury and property damage liability coverage at least as broad as the primary coverages set forth above, including commercial general liability, automobile liability, and employer's liability. Such policy or policies shall include the following terms and conditions:

- A drop-down feature requiring the policy to respond in the event that any primary insurance that would otherwise have applied proves to be uncollectable in whole or in part for any reason;
- Pay on behalf of wording as opposed to reimbursement;
- Concurrency of effective dates with primary policies;
- Policies shall "follow form" to the underlying primary policies;

and

- Insureds under primary policies shall also be insureds under the umbrella or excess policies.

(6) Pollution liability insurance. Environmental Impairment Liability Insurance shall be written on a Contractor's Pollution Liability form or other form acceptable to CITY providing coverage for liability arising out of sudden, accidental and gradual pollution and remediation. The policy limit shall be no less than \$1,000,000 dollars per claim and in the aggregate. All activities contemplated in this Agreement shall be specifically scheduled on the policy as "covered operations." The policy shall provide coverage for the hauling of waste from the project site to the final disposal location, including non-owned disposal sites.

C. Other Provisions: Insurance policies required by this Agreement shall contain the following provisions:

(1) Notice of Cancellation: Each insurance policy required by this Agreement shall be endorsed and state the coverage shall not be suspended, voided, canceled by the insurer or other party to this Agreement, reduced in coverage or in limits except after thirty (30) days' prior written notice by certified mail, return receipt requested has been given to City.

(2) Primary/noncontributing: Coverage provided by Contractor shall be primary and any insurance or self-insurance procured or maintained by CITY shall not be required to contribute with it. The limits of insurance required herein may be satisfied by a combination of primary and umbrella or excess insurance. Any umbrella or excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-



contributory basis for the benefit of CITY before the CITY's own insurance or self-insurance shall be called upon to protect it as a named insured.

(3) City's Rights of Enforcement: In the event any policy of insurance required under this Agreement does not comply with these requirements or is canceled and not replaced, CITY has the right but not the duty to obtain the insurance it deems necessary and any premium paid by CITY will be promptly reimbursed by Contractor or CITY will withhold amounts sufficient to pay premium from Contractor payments. In the alternative, CITY may cancel this Agreement.

(4) Waiver of Subrogation: All insurance coverage maintained or procured pursuant to this agreement shall be endorsed to waive subrogation against CITY, its elected or appointed officers, agents, officials, employees and volunteers or shall specifically allow Contractor or others providing insurance evidence in compliance with these specifications to waive their right of recovery prior to a loss. Contractor hereby waives its own right of recovery against CITY, and shall require similar written express waivers.

(5) Enforcement of Contract Provisions (non estoppel): Contractor acknowledges and agrees that any actual or alleged failure on the part of the CITY to inform Contractor of non-compliance with any requirement imposes no additional obligations on the CITY nor does it waive any rights hereunder.

(6) Requirements not Limiting: Requirements of specific coverage features or limits contained in this Section are not intended as a limitation on coverage, limits or other requirements, or a waiver of any coverage normally provided by any insurance. Specific reference to a given coverage feature is for purposes of clarification only as it pertains to a given issue and is not intended by any party or insured to be all inclusive, or to the exclusion of other coverage, or a waiver of any type. If the Contractor maintains higher limits than the minimums shown above, the CITY requires and shall be entitled to coverage for the higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the CITY.

(7) Prohibition of Undisclosed Coverage Limitations: None of the coverages required herein will be in compliance with these requirements if they include any limiting endorsement of any kind that has not been first submitted to CITY and approved of in writing.

(8) Separation of Insureds: A severability of interests provision must apply for all additional insureds ensuring that Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the insurer's limits of liability. The policy(ies) shall not contain any cross-liability exclusions.

(9) Pass through Clause: Contractor agrees to ensure that its subconsultants, subcontractors, and any other party involved with the project who is brought onto or involved in the project by Contractor, provide the same minimum insurance coverage and endorsements required of Contractor. Contractor agrees to monitor and review all such coverage and assumes all responsibility for ensuring that such coverage is provided in conformity with the requirements of this section. Contractor agrees that upon request, all agreements with consultants, subcontractors, and others engaged in the project will be submitted to CITY for review.

(10) City's Right to Revise Requirements: The CITY reserves the right at any time during the term of the contract to change the amounts and types of insurance required by giving the Contractor a ninety (90) day advance written notice of such change. If such change results in substantial additional cost to the Contractor, the CITY and Contractor may renegotiate Contractor's compensation.

(11) Self-insured Retentions: Any self-insured retentions must be declared to and approved by CITY. CITY reserves the right to require that self-insured retentions be eliminated, lowered, or replaced by a deductible. Self-insurance will not be considered to comply with these specifications unless approved by CITY.

(12) Timely Notice of Claims: Contractor shall give CITY prompt and timely notice of claims made or suits instituted that arise out of or result from Contractor's performance under this Agreement, and that involve or may involve coverage under any of the required liability policies.

(13) Additional Insurance: Contractor shall also procure and maintain, at its own cost and expense, any additional kinds of insurance, which in its own judgment may be necessary for its proper protection and prosecution of the Work.

Section 17. Assignment. The expertise and experience of Contractor are material considerations for this Agreement. City has an interest in the qualifications of and capability of the persons and entities who will fulfill the duties and obligations imposed upon Contractor under the Agreement. In recognition of that interest, Contractor shall not assign or transfer this Agreement or any portion of this Agreement or the performance of any of Contractor's duties or obligations under this Agreement without the prior written consent of the City Council. Any attempted assignment shall be ineffective, null and void, and shall constitute a material breach of this Agreement, entitling City to any and all remedies at law or in equity, including summary termination of this Agreement. City acknowledges, however, that Contractor, in the performance of its duties pursuant to this Agreement, may utilize sub contractors.

Section 18. Continuity of Personnel. Contractor shall make every reasonable effort to maintain the stability and continuity of Contractor's staff assigned to perform the services required under this Agreement. Contractor shall notify City of any changes in Contractor's staff assigned to perform the services required under this Agreement, prior to any such performance.

#### Section 19. Termination of Agreement.

(a) City may terminate this Agreement, with or without cause, at any time by giving thirty (30) days' written notice of termination to Contractor. In the event such notice is given, Contractor shall cease immediately all work in progress.

(b) Contractor may terminate this Agreement at any time upon thirty (30) days' written notice of termination to City.

(c) If either Contractor or City fail to perform any material obligation under this

Agreement, then, in addition to any other remedies, either Contractor or City may terminate this Agreement immediately upon written notice.

(d) Upon termination of this Agreement by either Contractor or City, all property belonging exclusively to City which is in Contractor's possession shall be returned to City. Contractor shall furnish to City a final invoice for work performed and expenses incurred by Contractor, prepared as set forth in Section 4 of this Agreement. This final invoice shall be reviewed and paid in the same manner as set forth in Section 4 of this Agreement.

Section 20. Default. In the event that Contractor is in default under the terms of this Agreement, the City shall not have any obligation or duty to continue compensating Contractor for any work performed after the date of default and may terminate this Agreement immediately by written notice to Contractor.

Section 21. Excusable Delays. Contractor shall not be liable for damages, including liquidated damages, if any, caused by delay in performance or failure to perform due to causes beyond the control of Contractor. Such causes include, but are not limited to, acts of God, acts of the public enemy, acts of federal, state or local governments, acts of the City, court orders, fires, floods, epidemics, strikes, embargoes, and unusually severe weather. The term and price of this Agreement shall be equitably adjusted for any delays due to such causes.

Section 22. Cooperation by City. All public information, data, reports and maps as are existing and available to City as public records, and which are necessary for carrying out the work as outlined in Exhibit A, shall be furnished to Contractor in every reasonable way to facilitate, without undue delay, the work to be performed under this Agreement.

Section 23. Notices. All notices required or permitted to be given under this Agreement shall be in writing and shall be personally delivered, or sent by telecopier or United States mail, postage prepaid, addressed as follows:

To City:                      City Administrator  
   City of Guadalupe  
   918 Obispo Street  
   Guadalupe, CA 93434

To Contractor:

Notice shall be deemed effective on the date personally delivered or transmitted by facsimile or, if mailed, three (3) days after deposit of the same in the custody of the United States Postal Service.

Section 24. Authority to Execute. The person or persons executing this Agreement on behalf of the Contractor represents and warrants that they have the authority to so execute this Agreement and to bind Contractor to the performance of its obligations hereunder.

Section 25. Binding Effect. This Agreement shall be binding upon the heirs, executors, administrators, successors and assigns of the parties.

Section 26. Modification of Agreement. No amendment to or modification of this Agreement shall be valid unless made in writing and approved by the Contractor and by the City Council. The parties agree that this requirement for written modifications cannot be waived and that any attempted waiver shall be void.

Section 27. Waiver. Waiver by any party to this Agreement of any term, condition or covenant of this Agreement shall not constitute a waiver of any other term, condition or covenant. Waiver by any party of any breach of the provisions of this Agreement shall not constitute a waiver of any other provision, nor a waiver of any subsequent breach or violation of any provision of this Agreement. Acceptance by City of any work or services by Contractor shall not constitute a waiver of any provisions of this Agreement.

Section 28. Law to Govern; Venue. This Agreement shall be interpreted, construed and governed according to the laws of the State of California. In the event of litigation between the parties, venue in state trial courts shall lie exclusively in the County of Santa Barbara. In the event of litigation in a U.S. District Court, venue shall lie exclusively in the Central District of California, in Los Angeles.

Section 29. Attorney's Fees, Costs and Expenses. In the event litigation or other proceeding is required to enforce or interpret any provision of this Agreement, the prevailing party in such litigation or other proceeding shall be entitled to any award of reasonable attorney's fees, costs and expenses, in addition to any other relief to which it may be entitled.

Section 30. Entire Agreement. This Agreement, including the attached exhibits, is the entire, complete, final and exclusive expression of the parties with respect to the matters addressed therein and supersedes all other agreements or understandings, whether oral or written, or entered into between Contractor and City prior to the execution of this Agreement. No statements, representations or other agreements, whether oral or written, made by any party which are not embodied herein shall be valid and binding. No amendment to this Agreement shall be valid and binding unless in writing duly executed by the parties or their authorized representatives.

Section 31. Severability. If a term, condition or covenant of this Agreement is declared or determined by any court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions of this Agreement shall not be affected thereby, and the Agreement shall be read and construed without the invalid, void or unenforceable provision(s).

Section 32. Preparation of Agreement. This Agreement is the product of negotiation and preparation by and among the parties and their respective attorneys. The parties, therefore, expressly acknowledge and agree that this Agreement shall not be deemed prepared or drafted by one party or another, or any party's attorney, and will be construed accordingly.

CITY:

CITY OF GUADALUPE

By: \_\_\_\_\_  
Ariston Julian, Mayor

APPROVED AS TO FORM:

\_\_\_\_\_  
Philip Sinco, City Attorney

CONTRACTOR:

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

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

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

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

**SPECIAL PROVISIONS**

**SECTION 1**

**SPECIFICATIONS AND PLANS**

**1-1 SPECIFICATIONS AND PLANS.**

The work embraced herein shall be done in accordance with the Standard Specifications dated 2018, the Standard Plans dated 2018, of the State of California, Department of Transportation (Caltrans), and the City of Santa Maria Standard Specifications and Standard Plans (adopted by the City of Guadalupe on June 23, 2009, pursuant to Resolution No. 2009-24), insofar as the same may apply and in accordance with the Plans and Special Provisions.

In case of conflict between the Standard Specifications and these special provisions, these special provisions shall take precedence over and be used in lieu of such conflicting portions.

Any discrepancies found between the Plans and specifications and site conditions or any inconsistencies or ambiguities in the Plans or specifications shall be immediately reported to the Engineer in writing, who shall promptly correct such inconsistencies or ambiguities in writing. Work done by the Contractor after his discovery of such discrepancies, inconsistencies, or ambiguities shall be done at the Contractor's risk.

**1-2 DEFINITIONS AND TERMS.**

Whenever, in the Plans and Special Provisions, or in any documents or instruments where the Plans and Special Provisions govern, the following terms are used or pronouns in place of them are used, the intent and meaning shall be interpreted as follows:

- A. **Bid**. An offer to furnish the necessary services and materials to perform the work called for by the Contract Documents.
- B. **Bidder**. Any individual, firm or corporation submitting a proposal for the work contemplated, acting directly or through a duly authorized representative.
- C. **Proposal**. The offer of the Bidder for the Work when made out and submitted on the prescribed Proposal Form, properly signed and guaranteed.
- D. **Proposal Guaranty**. The cash, check or Bidder's Bond accompanying the Proposal submitted by the Bidder as a guarantee that the Bidder will enter into a Contract with the City for the construction of the Work if awarded to him.
- E. **Work**. All work specified, indicated, shown or contemplated in the Contract to construct the improvements, including all alterations, amendments or extensions thereto made by Change Orders or other written orders by the City Engineer.
- F. **City**. The City of Guadalupe, California, as created by law, and its authorized representatives.
- G. **Contract**. Written and executed contract between the City and the Contractor.
- H. **Contract Documents**. The Notice to Bidders, Proposal, Bid Sheet(s), Certification of Affirmative Action Program, Contractor's Licensing Statement, List of Subcontractors, Bid Security, Non-Collusion Affidavit, Agreement, Faithful Performance Bond, Labor and Materials Bond, Maintenance Bond, Worker's Compensation Certificate, Notice of Award, Notice to Proceed, Plans and Special Provisions, any addenda and bulletins issued during the bidding period, and all Change Orders amending or extending the work contemplated and which may be required to complete the work in a substantial and acceptable manner.

- I. **Plans**. The official plans, typical cross-sections, general cross-sections, working drawings and supplemental drawings, or reproductions thereof, approved by the City Engineer, which show the location, character, dimensions and details of the work to be done, and which are to be considered as a part of the Contract supplementary to the Special Provisions.
- J. **Special Provisions**. The Special Provisions are specific clauses setting forth conditions or requirements peculiar to the particular work called for by the Plans.
- K. **City Standard Specifications and Drawings**. Where reference is made to the City Standard Specifications and Drawings, the reference shall be to the City of Santa Maria Public Works Department Standard Specifications and Drawings (adopted by the City of Guadalupe on June 23, 2009, pursuant to Resolution No. 2009-24).
- L. **Standard Specifications**. Where reference is made to the Standard Specifications, the reference shall be to the State of California Department of Transportation Standard Specifications, 2018, or the latest edition thereof.
- M. **Standard Plans**. Where reference is made to the Standard Plans, the reference shall be to the State of California Department of Transportation Standard Plans, 2018, or the latest edition thereof.
- N. **Days**. Unless otherwise designated, days as used in the Contract Documents will be understood to mean working days.
- O. **Liquidated Damages**. The amount prescribed in the Specifications to be paid to the City, or to be deducted from any payments due or to become due Contractor, for each day's delay in completing the Work beyond the time allowed in the Specifications.
- P. **City Engineer**. The City Engineer of the City of Guadalupe, acting either directly or through properly authorized agents, such agents acting within the scope of the particular duties delegated to them.
- Q. **Inspector**. An authorized representative of the City of Guadalupe assigned by the City to make inspection of work performed or material supplied by Contractor.
- R. **Superintendent**. The executive representative of Contractor present on the work at all times during progress, authorized to receive and fulfill instructions from the City Engineer.
- S. **Design Engineer**. That individual or firm responsible for the design of the project, when the design is not by the City Engineer.
- T. **Legal Holidays**.

January 1 (New Year's Day)  
 Third Monday in January (Martin Luther King Day)  
 Third Monday in February (Presidents' Day)  
 Last Monday in May (Memorial Day)  
 July 4 (Independence Day)  
 First Monday in September (Labor Day)  
 November 11 (Veterans' Day)  
 Thanksgiving Day  
 Friday following Thanksgiving Day  
 December 24 (Christmas Eve)  
 December 25 (Christmas Day)

Any public holiday(s) which the President, Governor, or City Council of the City of Guadalupe may proclaim. When a holiday falls on a Saturday, the preceding Friday shall be observed. When a holiday falls on a Sunday, the following Monday shall be observed.

Where State Agencies, State Departments or State Officers are referred to in the above-mentioned Standard Specifications and Standard Plans, the comparable City Agency, City Department or City Officer shall be meant thereby for the purposes of these Contract Documents. In particular, intent and meaning shall be interpreted as follows:

STATE, OR COUNTY OR  
STATE OF CALIFORNIA..... CITY OF GUADALUPE

DEPARTMENT OR DEPARTMENT  
OF TRANSPORTATION..... CITY COUNCIL  
CITY OF GUADALUPE

DIRECTOR OR DIRECTOR  
OF TRANSPORTATION..... DIRECTOR OF PUBLIC WORKS  
EITHER DIRECTLY OR THROUGH PROPERLY  
AUTHORIZED AGENT AND CONSULTANTS

ATTORNEY GENERAL ..... CITY ATTORNEY, CITY OF GUADALUPE



## **SECTION 2 PROPOSAL REQUIREMENTS AND CONDITIONS**

### **2-1 CONTENTS OF PROPOSAL FORMS.**

Prospective bidders will be furnished with proposal forms, bound together with this Project Manual, which will refer to the Specifications and Plans for the work to be done.

### **2-2 EXAMINATION OF PLANS, SPECIFICATIONS, CONTRACT, AND SITE OF WORK.**

The bidder shall examine carefully the site of the work contemplated, The Plans and Specifications, and the Proposal and Contract forms.. The submission of a bid shall be conclusive evidence that the bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, and as to the requirements of the Contract Documents.

- (a) Where the City has made investigations of site conditions, including subsurface conditions in areas where work is to be performed under the Contract, or in other areas, some of which may constitute possible local material sources, bidders or contractors may, upon written request, inspect the records of the City as to those investigations subject to and upon the conditions hereinafter set forth. The investigations are made only for the purpose of study and design.
- (b) Where there has been prior construction by the City or other public agencies within the project limits, records of the prior construction that are currently in the possession of the City and which have been used by, or are known to, the designers and administrators of the Project will be made available for inspection by bidders or contractors, upon written request, subject to the conditions hereinafter set forth. The records may include, but are not limited to, as-built drawings, design calculations, foundation and site studies, Project reports and other data assembled in connection with the investigation, design, construction and maintenance of the prior projects.
- (c) Inspection of the records of investigations and Project records may be made at the office of the City Engineer. The records of investigations and Project records are not a part of the Contract and are available solely for the convenience of the bidder or contractor. It is expressly understood and agreed that the City assumes no responsibility whatsoever in respect to the sufficiency or accuracy of the investigations thus made, the records thereof, or of Project records, or of the interpretations set forth therein or made by the City in its use thereof and there is no warranty or guaranty, either express or implied, that the conditions indicated by the investigations or records are representative of those existing in or throughout those areas, or any part thereof, or that unlooked-for developments may not occur, or that materials other than, or in proportions different from those indicated, may not be encountered.
- (d) In some instances, information considered by the City to be of possible interest to bidders or contractors has been compiled as "Materials Information." The "Materials Information" is not a part of the Contract and is furnished solely for the convenience of bidders or contractors. It is understood and agreed that the fact that the City has compiled information as "Materials Information" and has exhibited or furnished to the bidders or contractors the "Materials Information" shall not be construed as a warranty or guaranty, express or implied, as to the completeness or accuracy of the compilations and the use of the "Materials Information" shall be subject to all of the conditions and limitations set forth herein.
- (e) When contour maps were used in the design of the Project, the bidders may inspect those maps, and if available, they may obtain copies for their use.
- (f) The availability or use of information described herein is not to be construed in any way as a waiver of the provisions of the first paragraph in this Section 2. and a bidder or contractor is cautioned to make any independent investigation and examination as they deem necessary to be satisfied as to conditions to be encountered in the performance of the work and, with respect to possible local material sources, the quality

and quantity of material available from the property and the type and extent of processing that may be required in order to produce material conforming to the requirements of the Specifications.

- (g) No information derived from the inspection of investigations or compilation thereof made by the City or from the Architect, or the Architect's assistants, will in any way relieve the bidder or contractor from any risk or from properly fulfilling the terms of the Contract.

### **2-3 APPROXIMATE ESTIMATE.**

The quantities given in the proposal and contract are approximate only, being given as a basis for the comparison of bids. The City does not, expressly or by implication, agree that the actual amount of work will correspond therewith, and reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Engineer.

### **2-4 PROPOSAL FORMS.**

The City will furnish to each bidder a standard proposal form, which, when filled out and executed may be submitted as that bidder's bid. Bids not presented on forms so furnished, and copies or facsimiles of the bidder's completed and executed proposal forms submitted, as a bid will be rejected.

All proposal forms shall be obtained from the office of the Building Department, City of Guadalupe, 918 Obispo Street, Guadalupe, California 93434 as designated in the Notice to Contractors.

### **2-5 PREPARATION AND SUBMISSION OF BIDS.**

- (a) All Bids shall be submitted on the City furnished proposal forms. The proposal shall be submitted as directed in the Notice to Contractors under sealed cover plainly marked as a proposal and identifying the project to which the proposal relates and the date of the bid opening therefor. Proposals that are not properly marked may be disregarded.
- (b) All bid Items and statements shall be properly filled out. The proposal shall set forth the item prices and totals, in clearly legible figures, in the respective spaces provided, and shall be signed by the bidder in longhand, who shall fill out all blanks in the proposal form as therein required.
- (c) Bids shall not contain any recapitulations of the Work. Alternative Bids will not be received or considered unless required by the Contract Documents. No oral, telegraphic, or telephonic Proposals or modifications will be considered.
- (d) Each Bid shall be accompanied by the prescribed bid and other required documents.
- (e) Delivery of Bids shall comply with the Notice to Contractors as to place, date, and time. Bids and bid security shall be enclosed in a sealed opaque envelope bearing the title of the Work and the name of the bidder.
- (f) Prices, wording, and notations must be in ink or typewritten. No erasures will be permitted. Mistakes may be crossed out and corrections typed or written in ink adjacent thereto and must be initialed in ink by the person or persons signing the Bid.

### **2-6 INTERPRETATIONS.**

Should any bidder find discrepancies or omissions in the Contract Documents, or if there should be doubt as to the true meaning of any part thereof, the bidder shall at once submit a written request for correction, clarification, or interpretation to the City Engineer. Such requests shall be submitted at least six days prior to the date fixed for the opening of Bids.

- (a) If the City determines the Contract Documents require changes, correction, clarification, or interpretation prior to the receipt of Bids, an appropriate bulletin or Addendum will be issued. All addenda so issued shall become part of the Contract Documents.
- (b) The City, its officers, employees, and agents shall not be responsible for any changes, instructions, clarifications, interpretations, or other information pertaining to the Contract Documents given to bidders during the bidding period in any manner other than written addenda.

## **2-7 REQUIRED LISTING OF PROPOSED SUBCONTRACTORS.**

Each Proposal shall have listed therein the name and address of each subcontractor to whom the bidder proposes to subcontract portions of the work in an amount in excess of one-half of one percent of the total bid or \$10,000, whichever is greater, in accordance with the Subletting and Subcontracting Fair Practices Act, commencing with Section 4100 of the Public Contract Code. The bidder's attention is invited to other provisions of the Act related to the imposition of penalties for a failure to observe its provisions by using unauthorized subcontractors or by making unauthorized substitutions.

- (a) A sheet for listing the subcontractors, as required herein, is included in the "Proposal" book.

## **2-8 DESIGN ENGINEERS MAY NOT BID ON CONSTRUCTION CONTRACT.**

No engineering or architectural firm that has provided design services for a project shall be eligible to submit a Proposal for the Contract to construct the Project nor to subcontract for any portion of the work. The ineligible firms include the prime contractor for design, subcontractors of portions of the design, and affiliates of either. An affiliate is a firm that is subject to the control of the same persons, through joint ownership or otherwise.

## **2-9 REJECTION OF PROPOSALS.**

Proposals may be rejected if they have been transferred to another bidder, or if they show any alteration of form, additions not called for, conditional bids, incomplete bids, erasures, or irregularities of any kind.

- (a) When Proposals are signed by an agent, other than the officer or officers of a corporation authorized to sign contracts on its behalf or a member of a partnership, a "Power of Attorney" must be on file with the City prior to opening bids or shall be submitted with the Proposal; otherwise, the Proposal may be rejected as irregular and unauthorized.

## **2-10 PROPOSAL GUARANTY.**

All bids shall be presented under sealed cover and accompanied by one of the following forms of bidder's security:

- (a) Cash, a cashier's check, a certified check, or a bidder's bond executed by an admitted surety insurer, made payable to the City of Guadalupe.
- (b) The security shall be in an amount equal to at least 10 percent of the amount bid. A bid will not be considered unless one of the forms of bidder's security is enclosed with it.
- (c) The contractor shall use the bidder's bond form found in this Project Manual when bidding on the project. The bidder's bond form shall be properly filled out and executed. (Note: this form may be reproduced for transmittal to the surety for execution and attached to the front of the original bid bond form.)
- (d) Surety shall be listed in the Current Insurance Organizations Authorized By The Insurance Commissioner To Transact Business Of Insurance In The State Of California published by the Department of Insurance, State of California, or successor publication.

**2-11 WITHDRAWAL OF PROPOSALS.**

Any bid may be withdrawn at any time prior to the date and time fixed for the opening of bids only by written request for the withdrawal of the bid filed at the location at which the City received the bid. The request shall be executed by the bidder or the bidder's duly authorized representative. The withdrawal of a bid does not prejudice the right of the bidder to file a new bid. Whether or not bids are opened exactly at the time fixed for opening bids, a bid will not be received after that time, nor may any bid be withdrawn after the time fixed for the opening of bids.

**2-12 PUBLIC OPENING OF PROPOSALS.**

Proposals will be opened and read publicly at the time and place indicated in the Notice to Contractors. Bidders or their authorized agents are invited to be present.

**2-13 RELIEF OF BIDDERS.**

Attention is directed to the provisions of Public Contract Code Sections 5100 to 5107, inclusive, concerning relief of bidders and in particular to the requirement therein, that if the bidder claims a mistake was made in the bid presented, the bidder shall give the City written notice within five (5) working days (excluding Saturdays, Sundays, and state holidays) after the opening of the bids of the alleged mistake, specifying in the notice in detail how the mistake occurred.

**2-14 DISQUALIFICATION OF BIDDERS.**

More than one Proposal from an individual, firm, partnership, corporation, or combination thereof under the same or different names will not be considered. Reasonable grounds for believing that any individual, firm, partnership, corporation or combination thereof is interested in more than one Proposal for the work contemplated may cause the rejection of all Proposals in which that individual, firm, partnership, corporation or combination thereof is interested. If there is reason for believing that collusion exists among the bidders any or all Proposals may be rejected. Proposals in which the prices obviously are unbalanced may be rejected.

**2-15 MATERIAL GUARANTY.**

The successful bidder may be required to furnish a written guaranty covering certain items of work for varying periods of time from the date of acceptance of the Contract. The work to be guaranteed, the form, and the time limit of the guaranty will be specified in The Specifications. The guaranty shall be signed and delivered to the City of Guadalupe before acceptance of the Contract. Upon completion of the Contract the amounts of the 2 Contract bonds required in Article B, Paragraph 2, "Contract Bonds," may be reduced to conform to the total amount of the Contract bid prices for the work to be guaranteed, and this amount shall continue in full force and effect for the duration of the guaranty period. The payment bond shall not be reduced until the expiration of the time required by Section 3249 of the Civil Code.

**2-16 ADDENDA AND BULLETINS.**

Full consideration shall be given to all addenda in the preparation of Bids, as addenda form a part of the Contract Documents. Bidders shall verify the number of addenda issued, if any, and acknowledge the receipt of all addenda by filling in the Addendum number in the space provided on the signature page of the Proposal. Failure to so acknowledge may cause the Bid to be rejected as not responsive.

- (a) The City may issue bulletins to advise bidders of changed requirements. All bulletins shall be incorporated into or confirmed by subsequent addenda. Such addenda may modify previously issued bulletins.

**2-17 QUALIFICATIONS OF BIDDERS.**

- (a) All bidders must be currently licensed as contractors according to the laws of the State and legal jurisdiction of the place where the Work is located before contract award. All bidders are required to complete the Contractor's Licensing Statement included with the proposal forms.
- (b) No person, organization, or corporation is allowed to make, submit, or be interested in more than one Bid for the Work unless in a sub contractual relationship with respect to the Bids or unless Alternative Bids are required. A person, organization, or corporation submitting sub-Proposals or quoting prices or materials to bidders is not prevented from submitting a Bid for the entire Work.

**2-18 TRADE NAMES AND ALTERNATIVES.**

Requests for any "or equal" substitutions regarding a material, product, thing, or service shall be made in writing before contract award. After submitting a substitution request, the contractor shall have ten (10) days for the submission of data substantiating the request for substitution per section 6-1.05 of the Standard Specifications. All "or equal" substitutions shall be approved in writing.

## **SECTION 3 AWARD & EXECUTION OF CONTRACT**

### **3-1 AWARD OF CONTRACT.**

The right is reserved to reject any and all proposals. The award of the contract, if it be awarded, will be to the lowest responsible bidder whose proposal complies with all the requirements prescribed. Bids will be compared by the Total Mathematical Bid as determined by the Engineer. The Total Mathematical Bid is the summation of all required bid items, excluding bid alternates. Bid items are calculated by multiplying the Engineers Estimate quantities by the unit bid prices. In the case of a discrepancy between the Total Mathematical Bid and the total bid written, the Total Mathematical Bid shall govern.

The award of the bid, if made, will be made within 35 days after the opening of the Proposal and reviewing all "or equal" requests for substitutions. This period will be subject to extension for such further period as may be agreed upon in writing between the City and the bidder concerned.

### **3-2 EXECUTION OF CONTRACT.**

The contract shall be signed by the successful bidder and returned, together with the contract bonds, public liability and property damage insurance, and all other documentation required by the Contract Documents, within 15 days after the bidder has received the contract for execution.

### **3-3 CONTRACT BONDS.**

The successful bidder shall furnish, at the time of execution of the contract for work, and at his/her own expense, the two (2) bonds required by the State Contract Act. One bond shall secure the payment of the claims of laborers, mechanics, or material men employed on the work under the contract. The other bond shall guarantee the faithful performance of the contract. Sureties on each of said bonds shall be satisfactory to the City Attorney.

- (a) Each of the two (2) bonds shall be in a sum equal to at least one hundred percent (100%) of the contract price.
- (b) All alterations, extensions of time, extra and additional work, and other changes authorized by the Contract Documents may be made without securing the consent of the surety or sureties on the contract bonds.

### **3-4 PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE.**

CONTRACTOR shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property that may arise from or in connection with the performance of the work hereunder by the CONTRACTOR, his agents, representatives, employees, and subcontractors. CONTRACTOR must maintain general liability and umbrella or excess liability insurance for as long as there is a statutory exposure to completed operations claims. AGENCY and its officers, officials, employees, and agents shall continue as additional insureds under such policies.

- (a) Coverage shall be at least as broad as:
  - i. Insurance Services Office Commercial General Liability coverage (occurrence from CG 0001).
  - ii. Insurance Services Office Business Auto Coverage form number CA 0001, code 1 (any auto).
  - iii. Workers Compensation insurance as required by the State of California and Employer's Liability Insurance.

(b) Contractor shall maintain limits not less than:

General liability insurance: CONTRACTOR shall maintain commercial general liability insurance with coverage at least as broad as Insurance Services Office form CG 00 01, in an amount not less than \$1,000,000 per occurrence, \$2,000,000 general aggregate, for bodily injury, personal injury, and property damage, and a \$2,000,000 completed operations aggregate. The policy must include contractual liability that has not been amended. Any endorsement restricting standard ISO "insured contract" language will not be accepted.

Automobile liability insurance: CONTRACTOR shall maintain automobile insurance at least as broad as Insurance Services Office form CA 00 01 covering bodily injury and property damage for all activities of the CONTRACTOR arising out of or in connection with Work to be performed under this Agreement, including coverage for any owned, hired, non-owned or rented vehicles, in an amount not less than \$1,000,000 combined single limit for each accident. Employer's Liability: \$1,000,000 per accident for bodily injury or disease.

Umbrella or excess liability insurance: CONTRACTOR shall obtain and maintain an umbrella or excess liability insurance that will provide bodily injury, personal injury and property damage liability coverage at least as broad as the primary coverages set forth above, including commercial general liability, automobile liability, and employer's liability. Such policy or policies shall include the following terms and conditions:

- A drop-down feature requiring the policy to respond in the event that any primary insurance that would otherwise have applied proves to be uncollectable in whole or in part for any reason;
- Pay on behalf of wording as opposed to reimbursement;
- Concurrence of effective dates with primary policies;
- Policies shall "follow form" to the underlying primary policies; and
- Insureds under primary policies shall also be insureds under the umbrella or excess policies.

(c) Deductibles: Any deductibles or self-insured retentions must be declared to and approved by the City. At the option of the City, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the City, its trustees, officers, employees and volunteers; or the Contractor shall provide a financial guarantee satisfactory to the City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

(d) The general liability and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

- i. Additional Insured Status: policies shall provide or be endorsed to provide that the City and its officers, officials, employees, agents, and volunteers shall be additional insureds under such policies. This provision shall also apply to any excess/umbrella liability policies.
- ii. Primary/Noncontributing: Coverage provided by CONTRACTOR shall be primary and any insurance or self-insurance procured or maintained by AGENCY shall not be required to contribute with it. The limits of insurance required herein may be satisfied by a combination of primary and umbrella or excess insurance. Any umbrella or excess insurance shall contain or be endorsed to contain a provision that such coverage shall also apply on a primary and non-contributory basis for the benefit of AGENCY before the AGENCY's own insurance or self-insurance shall be called upon to protect it as a named insured.
- iii. Notice of cancellation: CONTRACTOR agrees to oblige its insurance agent or broker and insurers to provide to AGENCY with a thirty (30) day notice of cancellation (except for nonpayment for which a ten (10) day notice is required) or nonrenewal of coverage for each required coverage.

- iv. Waiver of Subrogation: All insurance coverage maintained or procured pursuant to this agreement shall be endorsed to waive subrogation against AGENCY, its elected or appointed officers, agents, officials, employees and volunteers or shall specifically allow CONTRACTOR or others providing insurance evidence in compliance with these specifications to waive their right of recovery prior to a loss. CONTRACTOR hereby waives its own right of recovery against AGENCY, and shall require similar written express waivers and insurance clauses from each of its subconsultants.
- (e) Acceptable Insurers: All insurance policies shall be issued by an insurance company currently authorized by the Insurance Commissioner to transact business of insurance or is on the List of Approved Surplus Line Insurers in the State of California, with an assigned policyholders' Rating of A- (or higher) and Financial Size Category Class VII (or larger) in accordance with the latest edition of Best's Key Rating Guide, unless otherwise approved by the AGENCY's risk manager
- (f) Evidence of Coverage: CONTRACTOR shall provide certificates of insurance to AGENCY as evidence of the insurance coverage required herein. Insurance certificates and endorsements must be approved by AGENCY's risk manager prior to commencement of performance. Current certification of insurance shall be kept on file with AGENCY at all times during the term of this contract. AGENCY reserves the right to require complete, certified copies of all required insurance policies, at any time.
- (g) Subcontractors Covered: Contractor shall include all subcontractors as insured under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverage and limits for subcontractors shall be subject to all the requirements stated herein.
- (h) Products/Completed Operations: Coverage shall extend a minimum of three (3) years after project completion. Coverage shall be included on behalf of the insured for covered claims arising out of the actions of independent contractors. If the insured is using subcontractors, the Policy must include work performed "by or on behalf" of the insured. Policy shall contain no language that would invalidate or remove the insurer's duty to defend or indemnify for claims or suits expressly excluded from coverage. Policy shall specifically provide for a duty to defend on the part of the insurer. The AGENCY, its officials, officers, agents, and employees, shall be included as additional insureds under the Products and Completed Operations coverage.
- (i) Agency's Rights of Enforcement: In the event any policy of insurance required under this Agreement does not comply with these requirements or is canceled and not replaced, AGENCY has the right but not the duty to obtain the insurance it deems necessary and any premium paid by AGENCY will be promptly reimbursed by CONTRACTOR or AGENCY will withhold amounts sufficient to pay premium from CONTRACTOR payments. In the alternative, AGENCY may cancel this Agreement.
- (j) Enforcement of Contract Provisions (non estoppel): CONTRACTOR acknowledges and agrees that any actual or alleged failure on the part of the AGENCY to inform CONTRACTOR of non-compliance with any requirement imposes no additional obligations on the AGENCY nor does it waive any rights hereunder.
- (k) Requirements not Limiting: Requirements of specific coverage features or limits contained in this Section are not intended as a limitation on coverage, limits or other requirements, or a waiver of any coverage normally provided by any insurance. Specific reference to a given coverage feature is for purposes of clarification only as it pertains to a given issue and is not intended by any party or insured to be all inclusive, or to the exclusion of other coverage, or a waiver of any type. If the CONTRACTOR maintains higher limits than the minimums shown above, the AGENCY requires and shall be entitled to coverage for the higher limits maintained by the CONTRACTOR. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the AGENCY.
- (l) Prohibition of Undisclosed Coverage Limitations: None of the coverages required herein will be in compliance with these requirements if they include any limiting endorsement of any kind that has not been first submitted to AGENCY and approved of in writing.
- (m) Separation of Insureds: A severability of interests provision must apply for all additional insureds ensuring that CONTRACTOR's insurance shall apply separately to each insured against whom claim is made or suit



is brought, except with respect to the insurer's limits of liability. The policy(ies) shall not contain any cross-liability exclusions.

- (n) Pass Through Clause. CONTRACTOR agrees to ensure that its subconsultants, subcontractors, and any other party involved with the project who is brought onto or involved in the project by CONTRACTOR, provide the same minimum insurance coverage and endorsements required of CONTRACTOR. CONTRACTOR agrees to monitor and review all such coverage and assumes all responsibility for ensuring that such coverage is provided in conformity with the requirements of this section. CONTRACTOR agrees that upon request, all agreements with consultants, subcontractors, and others engaged in the project will be submitted to AGENCY for review.
- (o) Agency's Right to Revise Requirements: The AGENCY reserves the right at any time during the term of the contract to change the amounts and types of insurance required by giving the CONTRACTOR a ninety (90) day advance written notice of such change. If such change results in substantial additional cost to the CONTRACTOR, the AGENCY and CONTRACTOR may renegotiate CONTRACTOR's compensation.
- (p) Self-insured Retentions: Any self-insured retentions must be declared to and approved by AGENCY. AGENCY reserves the right to require that self-insured retentions be eliminated, lowered, or replaced by a deductible. Self-insurance will not be considered to comply with these specifications unless approved by AGENCY.
- (q) Timely Notice of Claims: CONTRACTOR shall give AGENCY prompt and timely notice of claims made or suits instituted that arise out of or result from CONTRACTOR's performance under this Agreement, and that involve or may involve coverage under any of the required liability policies.
- (r) Additional Insurance: CONTRACTOR shall also procure and maintain, at its own cost and expense, any additional kinds of insurance, which in its own judgment may be necessary for its proper protection and prosecution of the Work.

### **3-5 FAILURE TO EXECUTE CONTRACT.**

Failure of the lowest responsible bidder, the second lowest responsible bidder, or the third lowest responsible bidder to execute the contract and file acceptable bonds as provided herein within ten (10) days, not including Saturdays, Sundays and legal holidays, after that bidder has received the contract for execution shall be just cause for the forfeiture of the Proposal guaranty. The successful bidder may file with the City Clerk a written notice, signed by the bidder or the bidder's authorized representative, specifying that the bidder will refuse to execute the contract if it is presented. The filing of this notice shall have the same force and effect as the failure of the bidder to execute the contract and furnish acceptable bonds within the time hereinbefore prescribed.

### **3-6 RETURN OF PROPOSAL GUARANTEES.**

The Proposal guaranties accompanying the Proposals of the first, second and third lowest responsible bidders will be retained until the contract has been finally executed, after which those Proposal guaranties, except bidders' bonds and any guaranties which have been forfeited, will be returned to the respective bidders whose Proposals they accompany. The Proposal guaranties, other than bidder's bonds, submitted by all other unsuccessful bidders will be returned upon determination, by the City, of the first, second and third lowest responsible bidders.

### **3-7 BIDDING PROTECT PROCEDURES**

#### **A. Time for submitting Protests**

1. A protest regarding bidding documents shall be submitted in writing by the protesting bidder to the City so that the protest is received five (5) days before the day scheduled for bid opening.
2. A protest regarding bid opening procedures, bids, of the selection of the successful bidder shall be

submitted in writing, by the protesting bidder to the City, so that the protest is received within seven (7) days after bid opening.

B. Protests shall include a clear detail of the reason for the protest and the remedies sought by the bidder submitting the protest.

C. The City will issue a response within twenty (20) days after receipt of protest.

## **SECTION 4 PROSECUTION, PROGRESS, AND ACCEPTANCE OF THE WORK**

### **4-1 GENERAL.**

Attention is directed to the provisions in Section 8, "Prosecution and Progress" of the Standard Specifications, and these special provisions

### **4-2 COMMENCEMENT OF WORK.**

The Contractor shall begin work within ten (10) working days after the date of the Notice to Proceed. This work shall be diligently prosecuted to completion before the expiration of the Time of Contract shown on the cover of the Project Manual.

The Contractor shall notify the Engineer, in writing, of the Contractor's intent to begin work at least 72 hours before work is begun. The notice shall be delivered to the Engineer and shall specify the date the Contractor intends to start.

### **4-3 LIQUIDATED DAMAGES.**

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 working days expressed in the contract, damage will be sustained by the City, and that it is and will be impracticable and extremely difficult to ascertain and determine the actual damage which the City will sustain in the event of and by reason of the delay; and it is therefore agreed that the Contractor will pay to the City, the sum of **\$1,500.00 per day**, for each and every calendar day delay in finishing the work in excess of the number of working days prescribed above; and the Contractor agrees to pay the liquidated damages herein provided for, and further agrees that the City may deduct the amount thereof from any moneys due or that may become due the Contractor under the contract.

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 working days specified, the Engineer shall have the right to increase the number of working days or not, as the Engineer may deem best to serve the interest of the City, and if the Engineer decides to increase the number of working 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.

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 that 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 that are processed, made, constructed, fabricated or manufactured to meet the specific requirements of the contract. Only the physical shortage of material will be considered under these provisions as a cause for extension of time. Delays in obtaining materials due to priority in filling orders will not constitute a shortage of materials.

If the Contractor is delayed in completion of the work by reason of changes made under Section 5, "Control of the Work," of the Standard Specifications, or by any act of the Engineer or of the City, 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.

It is the intention of the above provisions that the Contractor shall not be relieved of liability for liquidated damages or engineering and inspection charges for any period of delay in completion of the work in excess of that expressly provided for in this Section 4-3.

#### **4-4 PRE-CONSTRUCTION CONFERENCE.**

Prior to the issuance of the Notice to Proceed, a pre-construction conference may be held at the discretion of the City Engineer at Guadalupe City Hall for the purpose of discussing with the Contractor the scope of work, Plans, Specifications, existing conditions, materials to be ordered, equipment to be used, and all essential matters pertaining to the prosecution of and the satisfactory completion of the project as required. The Contractor's representative at this conference shall include all major superintendents for the work and may include major sub-contractors.

#### **4-5 PROGRESS SCHEDULE**

The Contractor shall submit a detailed CPM schedule to the Engineer one week before the Pre-Construction Meeting. The Contractor shall make revisions as required by the Engineer. Upon acceptance by the Engineer the schedule will become the accepted Construction Schedule. An accepted schedule is required before work may proceed. The schedule shall show the Work spread over the entire contract time available for construction.

The Contractor shall revise and update the Construction Schedule on or before the twentieth of each month showing the status of work actually completed during the preceding estimate period. The Contractor shall submit to the Engineer one (1) printed copy of the revised Construction Schedule with his/her monthly progress payment request for that period. The schedule shall indicate the controlling items of work for each phase of the project. Preparation and updating of Construction Schedule shall be performed at Contractor's sole expense.

Failure by the Contractor to submit updated or revised Construction Schedules when required may prevent acceptance of progress payment requests by the Engineer until such updated or revised Construction Schedules have been submitted for review and have been accepted by the Engineer.

If the Contractor has fallen behind the accepted Construction Schedule by more than fifteen (15) percentage points based on earned progress payments, the Contractor shall take steps, including, but not limited to, increasing the number of personnel, shifts, and/or overtime operations, days of work, and/or amount of construction equipment until such time as the Work is back on schedule. He/she shall also submit for review no later than the next request for partial payment, such supplementary schedule or schedules as may be deemed necessary to demonstrate the manner in which the rate of progress will be regained. All cost required to bring the Project back on schedule shall be borne by the Contractor without additional cost to the Agency.

If the Contractor falls behind the accepted construction schedule, as modified by such time extensions as may have been granted by the City for unavoidable delays, by more than thirty-five (35) percentage points based on earned progress payments, he/she shall be deemed in material breach of Contract and the Work may be turned over to the surety for completion within the scheduled time.

#### **4-6 DISPUTES AND CLAIMS**

##### GENERAL

Any and all decisions made on appeal pursuant to this Subsection 4-6 shall be in writing. Any "decision" purportedly made pursuant to this Subsection 4-6 which is not in writing shall not be binding upon the Agency and should not be relied upon the Contractor.

Nothing in this subsection shall be considered as relieving the Contractor from his duty to file the notice required under this Subsection or other duties required by the contract documents.

**NOTICE OF POTENTIAL CLAIM**

The Contractor shall not be entitled to the payment of any additional compensation for any cause, including any act, or failure to act, by the Engineer, or the happening of any event, thing or occurrence, unless he shall have given the Engineer due written notice of potential claim as hereinafter specified, provided, however, that compliance with this Subsection shall not be a prerequisite as to any claim which is based on differences in measurements or errors of computation as to contract quantities.

The written notice of potential claim shall set forth the reasons for which the Contractor believes additional compensation will or may be due, the nature of the costs involved, and, insofar as possible, the amount of the potential claim. The said notice as above required must have been given to the Engineer prior to the time that the Contractor shall have performed the work giving rise to the potential claim for additional compensation, if based on an act or for additional compensation, if based on an act or failure to act by the Engineer, or in all other cases within 15 days after the happening of the event, thing or occurrence giving rise to the potential claim.

It is the intention of this Subsection that differences between the parties arising under and by the virtue of the contract be brought to the attention of the Engineer at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Contractor hereby agrees that he shall have no right to additional compensation for any claim that may be based on any such act, failure to act, event, thing or occurrence for which no written notice of potential claim as herein required was filed.

**SECTION 5 (Not Used)**

**SECTION 6  
ADDITIONAL PROVISIONS AND NOTICES  
REQUIRED BY STATE LAW**

**6-1 GENERAL.**

This section contains additional provisions and notices required to be included in contracts for public works projects entered into by the City that are not covered in other sections of these special provisions.

**6-2 WORKING HOURS.**

The Contractor shall comply with all applicable provisions of Section 1810 to 1815, inclusive, of the California Labor Code relating to working hours. The Contractor shall as a penalty to the City, forfeit \$50.00 for each worker employed in the execution of the Contract by the Contractor or by any subcontractor for each calendar day during which such worker is required or permitted to work more than 8 hours in any one calendar day and 40 hours in any one calendar week, unless such worker receives compensation for all hours worked in excess of 8 hours at not less than 1-1/2 times the basic rate of pay.

**6-3 TRAVEL AND SUBSISTENCE PAY.**

- (a) As required by Section 1773.1 of the California Labor Code the Contractor shall pay travel and subsistence payments to each workman needed to execute the Work, as such travel and subsistence payments are defined in the applicable collective bargaining agreements filed in accordance with this Section.
- (b) To establish such travel and subsistence payments, the representative of any craft, classification, or type of workman needed to execute the contracts shall file with the Department of Industrial Relations fully executed copies of collective bargaining agreements for the particular craft, classification or type of work involved. Such agreements shall be filed within 10 days after their execution and thereafter shall establish such travel and subsistence payments whenever filed 30 days prior to the call for bids.

**6-4 PROTECTION OF WORKERS IN TRENCH EXCAVATIONS.**

As required by Section 6705 of the California Labor Code and in addition thereto, whenever work under the Contract involves the excavation of any trench or trenches 5 feet or more in depth, the Contractor shall submit for acceptance by the City or by a registered Civil or Structural Engineer, employed by the City, to whom authority to accept has been delegated, in advance of excavation, a detailed plan showing protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the Construction Safety Orders of the Division of Industrial Safety, the plan shall be prepared by a registered Civil or Structural Engineer employed by the Contractor, and all costs shall be considered as included in the Contract items of work designated in the Engineer's Estimate and no other additional compensation shall be allowed therefor. Nothing in this Section shall be deemed to allow the use of a shoring, sloping, or other protective system less effective than that required by the Construction Safety Orders. Nothing in this Section shall be construed to impose tort liability on the City, the Architect, nor any of their officers, agents, representatives, or employees.

**6-5 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 City. The Contractor shall obtain insurance to indemnify the City 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.

#### **6-6 CONCRETE FORMS, FALSE WORK, AND SHORING.**

The Contractor shall comply fully with the requirements of Section 1717 of the Construction Safety Orders, State of California, Department of Industrial Relations, regarding the design of concrete forms, FALSE WORK, and shoring and the inspection of same prior to placement of concrete. Where the said Section 1717 requires the services of a civil engineer registered in the State of California to approve design calculations and working drawings of the FALSE WORK or shoring system, or to inspect such system prior to placement of concrete, the Contractor shall employ a registered civil engineer for these purposes, and all costs therefor shall be included in the price named in the Contract for completion of the Work as set forth in the Contract Documents.

#### **6-7 SUBMISSION OF BIDS; AGREEMENT TO ASSIGN.**

In accordance with Section 4552 of the Government Code, the bidder shall conform to the following requirements. In submitting a bid to a public purchasing body, the bidder offers and agrees that if the bid is accepted, it will assign to the purchasing body all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. 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, materials, or services by the bidder for sale to the purchasing body pursuant to the bid. Such assignment shall be made and become effective at the time the purchasing body tenders final payment to the bidder.

#### **6-8 PUBLIC WORKS CONTRACTS; ASSIGNMENT TO AWARDING BODY.**

In accordance with Section 4551 of the Government Code, the Contractor and subcontractor shall conform to the following requirements. In entering into a public works contract or a subcontract to supply goods, services, or material pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the awarding body all rights, title and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. 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 public works contract of the subcontract. This assignment shall be made and become effective at the time the awarding body tenders final payment to the Contractor, without further acknowledgment by the parties.

#### **6-9 REMOVAL, RELOCATION OR PROTECTION OF EXISTING UTILITIES.**

In accordance with the provisions of Section 4215 of the Government Code, the Contractor shall not be assessed liquidated damages for delay in completion of the project, when such delay was caused by failure of the public agency or owner of the utility to provide for the removal or relocation of such utility facilities.

#### **6-10 SUBSTITUTION OF SECURITIES.**

Retainage from Monthly Payments: Pursuant to Section 22300 of the Public Code, the Contractor may substitute securities for any money withheld by the Owner 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 City 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 between the escrow agent and the City in accordance with the provisions of Section 4590. The City will not certify that the contract has been satisfactorily completed until at least 50 calendar days after filing by the City of a Notice of Completion. Securities eligible for investment under Section 22300 of the Public Contract Code shall be limited to those listed in Section 16430 of the Government Code and to bank or savings and loan certificates of deposit, interest bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed to by the Contractor and the City.

#### **6-11 LISTING OF SUBCONTRACTORS.**

As required under the provisions of Section 4104 et seq of the California Public Contract Code, any person making a bid or offer to perform the work, shall in his or her bid or offer, set forth: (a) the name and location of the place of

business of each subcontractor who will perform work or labor or render service to the prime contractor in or about the construction of the work or improvement in an amount in excess of one-half of 1 percent of the prime contractor's total bid; (b) the name and location of the place of business of each subcontractor licensed by the State of California who, under subcontract to the primary contractor specially fabricates and installs a portion of the work or improvement according to detailed drawings contained in , in an amount in excess of one-half of 1 percent of the prime contractor's total bid; (c) The portion of the work which will be done by each such subcontractor under this act. The prime contractor shall list only one subcontractor for each such portion of the work as itemized on the "List of Subcontractors," included in the Proposal.

#### **6-12 BIDS FOR TRENCHING AND EXCAVATION WORK.**

In accordance with the provisions of Section 6707 of the California Labor Code, whenever the state, a county, city and county, or city issues a call for bids for the construction of a pipeline, sewer, sewage disposal system, boring or jacking pits, or similar trenches or open excavation, which are five feet deep or deeper, such call shall specify that each bid submitted in response thereto shall contain, as a bid item, adequate sheeting, shoring, and bracing or equipment method, for the protection of life or limb, which shall conform to applicable safety orders.

#### **6-13 STATE WAGE DETERMINATION.**

- (a) As required by Sections 1770 and following, of the California Labor Code, the Contractor shall pay not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations. Copies of such prevailing rate of per diem wages are on file at the office of the City Engineer, which copies shall be made available to any interested party on request. The Contractor shall post a copy of such determination at each job site.
- (b) As provided in Section 1775 of the California Labor Code, the Contractor shall, as a penalty to the City, forfeit at least \$50.00 for each calendar day, or portion thereof, for each worker paid less than the State General Prevailing Wage Rates as determined by the Director of the Department of Industrial Relations or such work or craft in which such worker is employed for any public work done under the contract by it or by any subcontractor under it.

#### **6-14 PAYROLL RECORDS; RETENTION; INSPECTION; NONCOMPLIANCE PENALTIES; RULES AND REGULATIONS.**

- (a) As required under the provisions of Section 1776 of the California Labor Code, each Contractor and subcontractor shall keep an accurate payroll record, 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.
- (b) The payroll records enumerated herein, shall be certified and shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

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.

A certified copy of all payroll records enumerated herein, 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.

A certified copy of all payroll records enumerated herein, shall be made available upon request by the public for inspection or copies thereof made; provided, however, that 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 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 shall not be given access to the records at the principal offices of the Contractor.

- (c) Each Contractor shall file a certified copy of the records, enumerated herein, with the entity that requested the records within 10 days after receipt of a written request.

Any copy of records made available for inspection and copies furnished upon request to the public or any public agency by the awarding body, the Division of Apprenticeship Standard, or the Division of Labor Standards Enforcement shall be marked or obliterated in such a manner as to prevent disclosure of an individual's name, address, and social security number. The name and address of the Contractor awarded the contract or performing the contract shall not be marked or obliterated.

- (d) The Contractor shall inform the body awarding the Contract of the location of the records enumerated herein, including the street address, city and county, and shall, within 5 working days, provide a notice of change of location and address.
- (e) In the event of noncompliance with the requirements of this Article, the Contractor shall have 10 days in which to comply subsequent to receipt of written notice specifying in what respects the Contractor must comply with this Article. Should noncompliance still be evident after the 10-day period, the Contractor shall, as a penalty to the state or political subdivision on whose behalf the Contract is made or awarded, forfeit \$50.00 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. Responsibility for compliance with these Paragraphs lies with the Contractor.
- (f) 5% retention is to be subtracted from each invoice, to be paid to the contractor 35 days after the Notice of Completion is recorded with the County of Santa Barbara.

#### **6-15 APPRENTICES.**

Attention is directed to Sections 1777.5 and 1777.6 and 1777.7 of the California Labor Code and Title 8, California Administrative Code Section 200 et seq. To insure compliance and complete understanding of the law regarding apprentices, and specifically the required ratio thereunder, the Contractor (and subcontractor) should, where some question exists, contact the Division of Apprenticeship Standards prior to commencement of the work. Responsibility for compliance with this Paragraph lies with the Contractor. The Owner policy is to encourage the employment and training of apprentices on its construction contracts as may be permitted under local apprenticeship standards.

#### **6-16 WORKERS COMPENSATION.**

- (a) In accordance with the provisions of Section 1860 of the California Labor Code, the Contractor's attention is directed to the requirement that in accordance with the provisions of Section 3700 of the California Labor Code, every Contractor will be required to secure the payment of compensation of his or her employees.
- (b) In accordance with the provisions of Section 1861 of the California Labor Code, 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 requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract."

Full compensation for conforming to the provisions in Section 6, not otherwise provided for, shall be considered as included in prices paid for the various contract items of work involved and no additional compensation will be allowed therefor.

## **SECTION 7 MISCELLANEOUS**

### **7-1 LABOR NON-DISCRIMINATION.**

Attention is directed to Section 1735 of the Labor Code, which reads as follows:

“No discrimination shall be made in the employment of persons upon public works because of the race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, marital status, or sex of such persons, except as provided in Section 12940 of the Government Code, and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter.”

### **7-2 NIGHT, SATURDAY, SUNDAY, AND HOLIDAY WORK.**

No work shall be performed at night, on Saturdays, Sundays, or on legal holidays, except with the permission of the City Engineer and in accordance with such regulations, as they shall furnish in writing. Before performing any work at said times, the Contractor shall give written notice to the City Engineer so that proper inspection may be provided. "Night," as used in this paragraph, shall be deemed to include the hours from 5:00 p.m. to 7:00 a.m., of the next succeeding day.

### **7-3 (Not Used)**

### **7-4 PARTIAL AND FINAL PAYMENT.**

The retained percentage or security will be held by the City and will be due and payable to the Contractor fifty (50) days after final acceptance of the work by the City Council and/or City Administrator.

### **7-5 (Not Used)**

### **7-6 HAZARDOUS WASTE IN EXCAVATION.**

In accordance with Section 7104 of the Public Contract Code, the Contractor shall comply fully with the following requirements:

- (a) The Contractor shall promptly, and before the following conditions are disturbed, notify the City, in writing, of any:

Material encountered in excavation that the Contractor has reason to believe may be hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be moved to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

Subsurface of any latent physical conditions at the site differing from those indicated.

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.

- (b) That the City shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste, and cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work shall issue a change order under the procedures described in the Contract

- (c) That in the event that a dispute arises between the City and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by Contract or by law that pertain to the resolution of disputes between the contracting parties.

#### **7-7 PROJECT APPEARANCE.**

The Contractor shall maintain a neat appearance to the work.

- (a) During construction, the Contractor shall keep the work site, areas adjacent to the work site, and streets and alleys in an orderly condition, free and clear from debris and discarded materials.
- (b) Broken concrete, trench spoil, or other debris developed during construction shall be disposed of concurrently with its removal. If stock piling is necessary it shall be done only at the approval of the City Engineer, but in no case shall the debris remain for more than one week.

#### **7-8 DISPOSAL OF EXCESS MATERIAL.**

All material determined to be excess by the Engineer becomes property of the Contractor, unless otherwise indicated in these special provisions. All material approved for disposal at the City's Sanitary Landfill is subject to payment of current fees.

The Contractor shall obtain all applicable permits from the County of Santa Barbara for the dumping of materials outside the City Limits of Guadalupe.

#### **7-9 CLEANUP AND DUST CONTROL.**

Cleanup and dust control shall conform to Standard Specifications and these special provisions.

- (a) The Contractor shall apply water in amounts and at intervals as directed by the Engineer. The water supply vehicle and an operator shall be available within one hour's notice on Saturdays, Sundays, and holidays to perform dust control work. If the Contractor is not available for dust control measures, the City of Guadalupe will arrange for the work to be performed by others and will deduct all equipment, labor, and material costs thereof from the Contract amount.

#### **7-10 GUARANTEE.**

The Contractor shall be responsible for the repair or replacement of latent defects in workmanship or materials for a period of one year from the date of filing of the Notice of Completion.

#### **7-11 PROTECTION AND RESTORATION OF EXISTING IMPROVEMENTS.**

- (a) The Contractor shall be responsible for the protection and the restoration or replacement of any improvements existing on public or private property at the start of work or placed there during the progress of work and not specified or shown on the Plans to be permanently removed. Existing improvements shall include, but are not limited to, curbs, gutters, cross-gutters, sidewalks, driveways, lawns, sprinkler systems, shrubs, trees, fences, and walls. All existing improvements shall be reconstructed to equal or better than the existing improvements removed.

In submitting a bid, the Contractor will be deemed to have carefully examined the site of the work and to have acquainted himself with all conditions relating to the protection and restoration of existing improvements. The City of Guadalupe does not guarantee that all improvements are shown on the Plans, and it shall be the

Contractor's responsibility to provide in his bid for the protection and restoration of all existing improvements except those otherwise specified herein.

- (b) All curbs, gutters, sidewalks, and driveways shall be removed and replaced to the next joint or score line beyond the actually damaged or broken sections; or in the event that joints or score lines do not exist or are three or more feet from the removed or damaged section, the damaged portions shall be removed and reconstructed to neat, plane faces. All new concrete shall match, as nearly as possible, the appearance of adjacent concrete improvements.

## **7-12 UTILITIES.**

Utilities shall conform to the relevant provisions in the Standard Specifications and these special provisions.

- (a) Utilities for the purpose of these special provisions shall be considered as including, but not limited to: pipelines, conduits, transmission lines, and appurtenances of "Public Utilities" (as defined in the Public Utilities Act of the State of California) and those of private industry, businesses, or individuals solely for their own use or for use of their tenants; and storm drains, sanitary sewers, street lighting, and traffic signal systems. The City of Guadalupe has, by a search of known records, endeavored to locate and indicate on the Plans all utilities that exist within the limits of the work. However, the accuracy or completeness of the utilities indicated on the Plans is not guaranteed. Service connections to an adjacent property may or may not be shown on the Plans. It shall be the responsibility of the Contractor to determine the exact location of all utilities and their service connections. The Contractor shall make his own investigation as to the location, type, kind of material, age, and condition of existing utilities and their appurtenances and service connections which may be affected by the contract work; and, in addition, he shall notify the City as to any utilities, appurtenances, and service connections located by him which have been incorrectly shown on or omitted from the Plans.
- (b) The Contractor shall notify the owners of all utilities at least two working days in advance of excavation around any of their structures. At the completion of the contract work, the Contractor shall leave all utilities and appurtenances in a condition satisfactory to the owners and the City of Guadalupe.

## **7-13 (Not Used)**

## **7-14 SUBMITTALS.**

**7-1.14.A GENERAL-** Submittals covered by these requirements include manufacturers information, shop drawings, test procedures, test results, samples, requests for substitutions, and miscellaneous work-related submittals. Submittals shall also include, but not be limited to, all mechanical, electrical and electronic equipment and systems, materials, reinforcing steel, fabricated items, and piping and conduit details. The Contractor shall furnish all drawings, specifications, descriptive data, certificates, samples, tests, methods, schedules, and manufacturer's installation and other instructions as specifically required in the Contract Documents to demonstrate fully that the materials and equipment to be furnished and the methods of work comply with the provisions and intent of the Contract Documents.

**7-1.14.B CONTRACTOR'S RESPONSIBILITIES-**The Contractor shall be responsible for the accuracy and completeness of the information contained in each submittal and shall assure that the material, equipment or method of work shall be as described in the submittal. The Contractor shall verify that all features of all products conform to the specified requirements. Submittal documents shall be clearly edited to indicate only those items, models, or series of equipment, which are being submitted for review. All extraneous materials shall be crossed out or otherwise obliterated. The Contractor shall ensure that there is no conflict with other submittals and notify the Engineer in each case where his submittal may affect the work of another contractor or the City. The Contractor shall coordinate submittals among his subcontractors and suppliers

**7-1.14.C** The Contractor shall coordinate submittals with the work so that work will not be delayed. He shall coordinate and schedule different categories of submittals, so that one will not be delayed for lack of coordination with another. **No extension of time will be allowed because of failure to properly schedule submittals.** The Contractor shall not proceed with work related to a submittal until the submittal process is complete. This requires that submittals for review and comment shall be returned to the Contractor stamped "No Exceptions Taken" or "Make Corrections Noted."

**7-1.14.D** The Contractor shall certify on each submittal document that he has reviewed the submittal, verified field conditions, and complied with the Contract Documents

**7-1.14.E** The Contractor may authorize in writing a material or equipment supplier to deal directly with the Engineer or with the City with regard to a submittal. These dealings shall be limited to contract interpretations to clarify and expedite the work.

#### **7-1.14.F CATEGORIES OF SUBMITTALS**

**7-1.14.F(1) GENERAL-** Submittals fall into two general categories; submittals for review and comment, and submittals which are primarily for information only. Submittals that are for information only are generally specified as PRODUCT DATA in applicable specification sections.

**7-1.14.F(2) SUBMITTALS FOR REVIEW AND COMMENT-** All submittals except where specified to be submitted as product data for information only shall be submitted by the Contractor to the Engineer for review and comment

**7-1.14.F(3) SUBMITTALS (PRODUCT DATA) FOR INFORMATION ONLY-** Where specified, the Contractor shall furnish submittals (product data) to the Engineer for Information only.

#### **7-1.14.G TRANSMITTAL**

**7-1.14.G(1) GENERAL-** Unless otherwise specified, submittals regarding material and equipment shall be accompanied by a transmittal form approved by the Engineer. A separate transmittal form shall be used for each specific item, class of material, equipment, and items specified in separate, discrete sections, for which the submittal is required. Submittal documents common to more than one piece of equipment shall be identified with all the appropriate equipment numbers. Submittals for various items shall be made with a single form when the items taken together constitute a manufacturer's package or are so functionally related that expediency indicates checking or review of the group or package as a whole.

A unique number, sequentially assigned, shall be noted on the transmittal form accompanying each item submitted. Original submittal numbers shall have the following format: "XXX"; where "XXX" is the sequential number assigned by the Contractor. Re-submittals shall have the following format: "XXX-Y"; where "XXX" is the originally assigned submittal number and "Y" is a sequential letter assigned for re-submittals, i.e., A, B, or C being the 1st, 2nd, and 3rd re-submittals, respectively. Submittal 25B, for example, is the second re-submittal of submittal 25.

**7-1.14.G(2) DEVIATION FROM CONTRACT-** If the Contractor proposes to provide material, equipment, or method of work which deviates from these Special Provisions, he shall indicate so under "deviations" on the transmittal form accompanying the submittal copies.

**7-1.14.G(3) SUBMITTAL COMPLETENESS-** Submittals which do not have all the information required to be submitted, including deviations, are not acceptable and will be returned without review.

#### **7-1.14.H REVIEW PROCEDURE**

**7-1.14.H(1)GENERAL-** Submittals are specified for those features and characteristics of materials, equipment, and methods of operation which can be selected based on the Contractor's

judgment of their conformance to the specified requirements. Other features and characteristics are specified in a manner which enables the Contractor to determine acceptable options without submittals. The review procedure is based on the Contractor's guarantee that all features and characteristics not requiring submittals conform as specified. Review shall not extend to means, methods, techniques, sequences or procedures of construction, or to verifying quantities, dimensions, weights or gages, or fabrication processes (except where specifically indicated or required by these Special Provisions) or to safety precautions or programs incident thereto. Review of a separate item, as such, will not indicate approval of the assembly in which the item functions.

**7-1.14.H(2)** When the Contract Documents require a submittal, the Contractor shall submit 5 copies of all submitted information plus one reproducible original of all information shall be transmitted with submittals for review and comment.

**7-1.14.H(3)** SUBMITTALS FOR REVIEW AND COMMENT- Unless otherwise specified, within 10 calendar days after receipt of a submittal for review and comment, the Engineer shall review the submittal and return **3 copies** of the marked-up reproducible original noted in 1 above. The Engineer will retain the reproducible original. The returned submittal shall indicate one of the following actions:

7-1.14.H(3)a) If the review indicates that the material, equipment or work method complies with these Special Provisions, submittal copies will be marked "NO EXCEPTIONS TAKEN." In this event, the Contractor may begin to implement the work method or incorporate the material or equipment covered by the submittal.

7-1.14.H(3)b) If the review indicates limited corrections are required, copies will be marked "MAKE CORRECTIONS NOTED." The Contractor may begin implementing the work method or incorporating the material and equipment covered by the submittal in accordance with the noted corrections. Where submittal information will be incorporated in O&M data, a corrected copy shall be provided.

7-1.14.H(3)c) If the review reveals that the submittal is insufficient or contains incorrect data, copies will be marked "AMEND AND RESUBMIT." Except at his own risk, the Contractor shall not undertake work covered by this submittal until it has been revised, resubmitted and returned marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED."

7-1.14.H(3)d) If the review indicates that the material, equipment, or work method does not comply with these Special Provisions, copies of the submittal will be marked "Rejected - See Remarks." Submittals with deviations that have not been identified clearly may be rejected. Except at his own risk, the Contractor shall not undertake the work covered by such submittals until a new submittal is made and returned marked either "No Exceptions Taken" or "Make Corrections Noted."

**7-1.14.H(4)** SUBMITTALS (PRODUCT DATA) FOR INFORMATION ONLY- Such information is not subject to submittal review procedures and shall be provided as part of the work under this contract and its acceptability determined under normal inspection procedures.

**7-1.14.I** EFFECT OF REVIEW OF CONTRACTOR'S SUBMITTALS- review of contract drawings, methods of work, or information regarding materials or equipment the Contractor proposes to provide, shall not relieve the Contractor of his responsibility for errors therein and shall not be regarded as an assumption of risks or liability by the Engineer or the City, or by any officer or employee thereof, and the Contractor shall have no claim under the contract on account of the failure, or partial failure, of the method of work, material, or equipment so reviewed. A mark of "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED" shall mean that the City has no objection to the Contractor, upon his own responsibility, using the plan or method of work proposed, or providing the materials or equipment proposed.

## SECTION 8 (Not Used)

### SECTION 9 EXTRA WORK

#### 9-1.01 EXTRA WORK.

Extra Work shall be paid in accordance with Section 9 of these Special Provisions.

#### 9-1.02 GENERAL.

New or unforeseen work will be classified as "extra work" when the Engineer determines that it is not covered by Contract Unit Prices or Stipulated unit prices.

#### 9-1.03 EXTRA WORK PAYMENT.

When extra work is to be paid for on a force account basis the labor, materials and equipment used in the performance of such work shall be subject to the approval of the Engineer and compensation will be determined as follows:

**9-1.03A WORK PERFORMED BY CONTRACTOR.** The Contractor will be paid the direct costs for labor, materials and equipment used in performing the work determined as hereinafter provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," except where agreement has been reached to pay in accordance with Section 9-1.03B, "Work Performed by Special Forces or Other Special Services."

To the total of the direct costs computed as provided in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental," there will be added a markup of 33 percent to the cost of labor, 15 percent to the cost of materials, and 15 percent to the equipment rental. A markup for "Home Office Overhead" will not be allowed.

The above markups shall constitute full compensation for all overhead costs which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in Sections 9-1.03A(1), "Labor," 9-1.03A(2), "Materials," and 9-1.03A(3), "Equipment Rental." The total payment made as provided above shall be deemed to be the actual cost of such work and shall constitute full compensation therefor.

When extra work is performed by a subcontractor, approved in accordance with the provisions in Section 2-3, "Subcontracts," of the Standard Specifications, an additional markup of 5 percent will be added to the total cost of said extra work including all markups specified in this Section 9-1.03A. Said additional 5 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

**9-1.03A(1) LABOR.** The Contractor will be paid the cost of labor for the workmen (including foremen when authorized by the Engineer), used in the actual and direct performance of the work. The cost of labor, whether the employer is the Contractor, subcontractor, or other forces, will be the sum of the following:

**9-1.03A(1a) ACTUAL WAGES.** The actual wages paid shall include any employer payments to or on behalf of the workmen for health and welfare, pension, vacation, and similar purposes.

**9-1.03A(1b) LABOR SURCHARGE.** To the actual wages, as defined in Section 9-1.03A(1a), will be added a labor surcharge set forth in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract. Said labor surcharge shall constitute full compensation for all payments imposed by State and Federal laws and for all other payments made to, or on behalf of, the workmen, other than actual wages as defined in Section 9-1.03A(1a) and subsistence and travel allowance as specified in Section 9-1.03A(1c). Indirect labor costs, including superintendence, shall be considered part of the markup in 9-1.03A.

**9-1.03A(1c) SUBSISTENCE AND TRAVEL ALLOWANCE.** The actual subsistence and travel allowance paid to such workmen.

**9-1.03A(2) MATERIALS.** The City reserves the right to furnish such materials as it deems advisable, and the Contractor shall have no claims for costs and markup on such materials.

Only materials furnished by the Contractor and necessarily used in the performance of the work will be paid for. The cost of such materials will be the cost to the purchaser, whether Contractor, subcontractor or other forces, from the supplier thereof, except as the following are applicable:

**9-1.03A(2a)** If a cash or trade discount by the actual supplier is offered or available to the purchaser, it shall be credited to the City notwithstanding the fact that such discount may not have been taken.

**9-1.03A(2b)** If materials are procured by the purchaser by any method which is not a direct purchase from and a direct billing by the actual supplier to such purchaser, the cost of such materials shall be deemed to be the price paid to the actual supplier as determined by the Engineer plus the actual costs, if any, incurred in the handling of such materials.

**9-1.03A(2c)** If the materials are obtained from a supply or source owned wholly or in part by the purchaser, the cost of such materials shall not exceed the price paid by the purchaser for similar materials furnished from said source on contract items or the current wholesale price for such materials delivered to the job site, whichever price is lower.

**9-1.03A(2d)** If the cost of such materials is, in the opinion of the Engineer, excessive, then the cost of such material shall be deemed to be the lowest current wholesale price at which such materials were available in the quantities concerned delivered to the job site, less any discounts as provided in Section 9-1.03A(2a).

**9-1.03A(2e)** If the Contractor does not furnish satisfactory evidence of the cost of such materials from the actual supplier thereof within 60 days after the date of delivery of the material or within 15 days after acceptance of the contract, whichever occurs first, the City reserves the right to establish the cost of such materials at the lowest current wholesale prices at which such materials were available in the quantities concerned delivered to the location of the work, less any discounts as provided in Section 9-1.03A(2a).

**9-1.03A(3) EQUIPMENT RENTAL.** The Contractor will be paid for the use of equipment at the rental rates listed for such equipment in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract, regardless of ownership and any rental or other agreement, if such may exist, for the use of such equipment entered into by the Contractor, except that for those pieces of equipment with a rental rate of \$10.00 per hour or less as listed in the Labor Surcharge And Equipment Rental Rates publication and which are rented from a local equipment agency, other than Contractor owned, the Contractor will be paid at the hourly rate shown on the rental agency invoice or agreement for the time used on force account work as provided in Section 9-1.03A(3a), "Equipment on the Work." If a minimum equipment rental amount is required by the local equipment rental agency, the actual amount charged will be paid to the Contractor.



If it is deemed necessary by the Engineer to use equipment not listed in the said publication, a suitable rental rate for such equipment will be established by the Engineer. The Contractor may furnish any cost data, which might assist the Engineer in the establishment of such rental rate. If the rental rate established by the Engineer is \$10.00 per hour or less, the provisions above concerning rental of equipment from a local equipment agency shall apply.

The rental rates paid as above provided shall include the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

Operators of rented equipment will be paid for as provided in Section 9-1.03A(1), "Labor."

All equipment shall, in the opinion of the Engineer, be in good working condition and suitable for the purpose for which the equipment is to be used.

Unless otherwise specified, manufacturer's ratings and manufacturer approved modifications shall be used to classify equipment for the determination of applicable rental rates. Equipment which has no direct power unit shall be powered by a unit of at least the minimum rating recommended by the manufacturer.

Individual pieces of equipment or tools not listed in said publication and having a replacement value of \$500 or less, whether or not consumed by use, shall be considered to be small tools and no payment will be made therefor.

Rental time will not be allowed while equipment is inoperative due to breakdowns.

**9-1.03A(3a) EQUIPMENT ON THE WORK.** The rental time to be paid for equipment on the work shall be the time the equipment is in operation on the extra work being performed, and in addition, shall include the time required to move the equipment to the location of the extra work and return it to the original location or to another location requiring no more time than that required to return it to its original location, except that moving time will not be paid for if the equipment is used at the site of the extra work on other than such extra work. Loading and transporting costs will be allowed, in lieu of moving time, when the equipment is moved by means other than its own power, except that no payment will be made if the equipment is used at the site of the extra work on other than such extra work.

The following shall be used in computing the rental time of equipment on the work:

- (1) When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation.
- (2) When daily rates are listed, less than 4 hours of operation shall be considered to be 1/2 day of operation.

**9-1.03A(3b) EQUIPMENT NOT ON THE WORK.** For the use of equipment moved in on the work and used exclusively for extra work paid for on a force account basis, the Contractor will be paid the rental rates listed in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates, which is in effect on the date upon which the work is accomplished and which is a part of the contract, or determined as provided in Section 9-1.03A(3) and for the cost of transporting the equipment to the location of the work and its return to its original location, all in accordance with the following provisions:

- (1) The original location of the equipment to be hauled to the location of the work shall be agreed to by the Engineer in advance.
- (2) The State will pay the costs of loading and unloading such equipment.
- (3) The cost of transporting equipment in low bed trailers shall not exceed the hourly rates charged by established haulers.

(4) The cost of transporting equipment shall not exceed the applicable minimum established rates of the Public Utilities Commission.

(5) The rental period shall begin at the time the equipment is unloaded at the site of the extra work, shall include each day that the equipment is at the site of the extra work, excluding Saturdays, Sundays, and legal holidays unless the equipment is used to perform the extra work on such days, and shall terminate at the end of the day on which the Engineer directs the Contractor to discontinue the use of such equipment. The rental time to be paid per day will be in accordance with the following:

<i>Hours Equipment is in Operation</i>	<i>Hours to Be Paid</i>
0 .....	4
0.5 .....	4.25
1 .....	4.5
1.5 .....	4.75
2 .....	5
2.5 .....	5.25
3 .....	5.5
3.5 .....	5.75
4 .....	6
4.5 .....	6.25
5 .....	6.5
5.5 .....	6.75
6 .....	7
6.5 .....	7.25
7 .....	7.5
7.5 .....	7.75
8 .....	8
Over 8 .....	hours in operation

The hours to be paid for equipment, which is operated less than 8 hours due to breakdowns, shall not exceed 8 less the number of hours the equipment is inoperative due to breakdowns. When hourly rates are listed, less than 30 minutes of operation shall be considered to be 1/2 hour of operation. When daily rates are listed, payment for 1/2 day will be made if the equipment is not used. If the equipment is used, payment will be made for one day. The minimum rental time to be paid for the entire rental period on an hourly basis shall not be less than 8 hours or if on a daily basis shall not be less than one day.

(6) Should the Contractor desire the return of the equipment to a location other than its original location, the City will pay the cost of transportation in accordance with the above provisions, provided such payment shall not exceed the cost of moving the equipment to the work.

(7) Payment for transporting, and loading and unloading equipment, as above provided, will not be made if the equipment is used on the work in any other way than upon extra work paid for on a force account basis.

When extra work, other than work specifically designated as extra work in the plans and specifications, is to be paid for on a force account basis and the Engineer determines that such extra work requires the Contractor to move on to the work equipment which could not reasonably have been expected to be needed in the performance of the contract, the Engineer may authorize payment for the use of such

equipment at equipment rental rates in excess of those listed as applicable for the use of such equipment subject to the following additional conditions:

- (1) The Engineer shall specifically approve the necessity for the use of particular equipment on such work,
- (2) The Contractor shall establish to the satisfaction of the Engineer that such equipment cannot be obtained from his normal equipment source or sources and those of his subcontractors,
- (3) The Contractor shall establish to the satisfaction of the Engineer that the proposed equipment rental rate for such equipment from his proposed source is reasonable and appropriate for the expected period of use.
- (4) The Engineer shall approve the equipment source and the equipment rental rate to be paid by the City before the Contractor begins work involving the use of said equipment.

**9-1.03A(3c) OWNER-OPERATED EQUIPMENT.** When owner-operated equipment is used to perform extra work to be paid for on a force account basis, the Contractor will be paid for the equipment and operator, as follows:

Payment for the equipment will be made in accordance with the provisions in Section 9-1.03A(3), "Equipment Rental."

Payment for the cost of labor and subsistence or travel allowance will be made at the rates paid by the Contractor to other workmen operating similar equipment already on the project or, in the absence of such other workmen, at the rates for such labor established by collective bargaining agreements for the type of workman and location of the work, whether or not the owner-operator is actually covered by such an agreement. A labor surcharge will be added to the cost of labor described herein, in accordance with the provisions in Section 9-1.03A(1b), "Labor Surcharge."

To the direct cost of equipment rental and labor, computed as provided herein, will be added the markups for equipment rental and labor as provided in Section 9-1.03A, "Work Performed by Contractor."

**9-1.03A(3d) DUMP TRUCK RENTAL.** Dump truck rental shall conform to the provisions of Sections 9-1.03A(3), "Equipment Rental," 9-1.03A(3a), "Equipment on the Work," and 9-1.03A(3b), "Equipment not on the Work," except as follows:

Fully maintained and operated rental dump trucks used in the performance of extra work paid for on a force account basis will be paid for at the same hourly rate paid by the Contractor for use of fully maintained and operated rental dump trucks in performing contract item work.

In the absence of contract item work requiring dump truck rental, the Engineer will establish an hourly rental rate to be paid. The Contractor shall provide the Engineer with complete information on the hourly rental rates available for rental of fully maintained and operated dump trucks.

The provisions in Section 9-1.03A(1), "Labor," shall not apply to operators of rented dump trucks.

The rental rates listed for dump trucks in the Department of Transportation publication entitled Labor Surcharge And Equipment Rental Rates shall not apply.

To the total of the rental costs for fully maintained and operated dump trucks, including labor, there will be added a markup of 15 percent. An additional markup of 5 percent will be added by reason of performance of the work by a subcontractor. No separate markup will be made for labor.

The provisions of Section 9-1.03A(3c), "Owner-Operated Equipment," shall not apply to dump truck rentals.

**9-1.03B WORK PERFORMED BY SPECIAL FORCES OR OTHER SPECIAL SERVICES.** When the Engineer and the Contractor, by agreement, determine that a special service or an item of extra work cannot be performed by the forces of the Contractor or those of any of his subcontractors, such service or extra work item may be performed by a specialist. Invoices for such service or item of extra work on the basis of the current market price thereof may be accepted without complete itemization of labor, material, and equipment rental costs when it is impracticable and not in accordance with the established practice of the special service industry to provide such complete itemization.

In those instances wherein a Contractor is required to perform extra work necessitating a fabrication or machining process in a fabrication or machine shop facility away from the jobsite, the charges for that portion of the extra work performed in such facility may, by agreement, be accepted as a specialist billing.

To the specialist invoice price, less a credit to the State for any cash or trade discount offered or available, whether or not such discount may have been taken, will be added 15 percent in lieu of the percentages provided in Section 9-1.03A, "Work Performed by Contractor."

**9-1.03C RECORDS.** The Contractor shall maintain his records in such a manner as to provide a clear distinction between the direct costs of extra work paid for on a force account basis and the costs of other operations.

From the above records, the Contractor shall furnish the Engineer completed daily extra work reports, either on forms furnished by the City or on computerized facsimiles of the City's forms acceptable to the Engineer, for each day's extra work to be paid for on a force account basis. The daily extra work reports shall itemize the materials used, and shall cover the direct cost of labor and the charges for equipment rental, whether furnished by the Contractor, subcontractor, or other forces, except for charges described in Section 9-1.03B, "Work Performed by Special Forces or Other Special Services." The daily extra work reports shall provide names or identifications and classifications of workmen, the hourly rate of pay and hours worked, and also the size, type and identification number of equipment, and hours operated.

Material charges shall be substantiated by valid copies of vendor's invoices. Such invoices shall be submitted with the daily extra work reports, or if not available, they shall be submitted with subsequent daily extra work reports. Should said vendor's invoices not be submitted within 60 days after the date of delivery of the material or within 15 days after the acceptance of the contract, whichever occurs first, the City reserves the right to establish the cost of such materials at the lowest current wholesale prices at which said materials were available in the quantities concerned delivered to the location of work less any discounts as provided in Section 9-1.03A(2a).

Said daily extra work reports shall be signed by the Contractor or his authorized representative.

The Engineer will compare his records with the completed daily extra work reports furnished by the Contractor and make any necessary adjustments. When these daily extra work reports are agreed upon and signed by both parties, said reports shall become the basis of payment for the work performed, but shall not preclude subsequent adjustment based on a later audit by the City.

The Contractor's cost records pertaining to work paid for on a force account basis shall be open to inspection or audit by representatives of the City, during the life of the contract and for a period of not less than 3 years after the date of acceptance thereof, and the Contractor shall retain such records for that period. Where payment for materials or labor is based on the cost thereof to forces other than the Contractor, the Contractor shall make every reasonable effort to ensure that the cost records of such other forces will be open to inspection and audit by representatives of the City on the same terms and conditions as the cost records of the Contractor. If an audit is to be commenced more than 60 days after the acceptance date of the contract, the Contractor will be given a reasonable notice of the time when such audit is to begin.

#### **9-1.04 PAYMENT**

Payment as provided in Sections 9-1.03A, "Work Performed by Contractor," and 9-1.03B, "Work Performed by Special Forces or Other Special Services," shall constitute full compensation to the Contractor for performance of work paid for on a force account basis and no additional compensation will be allowed therefor.

**SECTION 10  
TECHNICAL SPECIFICATIONS**

CITY OF GUADALUPE  
PIONEER LIFT STATION AND FORCE MAIN PROJECT

TECHNICAL SPECIFICATIONS  
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Appendix

A CALTRANS ENCROACHMENT PERMIT

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## SECTION 011100 COORDINATION OF WORK, PERMITS, AND REGULATIONS

### 1.01 DESCRIPTION

This section generally describes the project and includes Contractor's use of premises, maintenance and operation of existing facilities, and permits.

### 1.02 GENERAL NATURE OF WORK

The work involves replacement of the Pioneer sewage lift station, installation of approximately 40 feet of 8 inch gravity sewer pipe, and installation of approximately 500 feet of 4 inch force main pipe.

### 1.03 LOCATION OF PROJECT SITE

The project site is located in Guadalupe, CA from the intersection of Pioneer Street and 8<sup>th</sup> Street to roughly 30 feet south of the 8<sup>th</sup> Street and Highway 1 intersection.

### 1.04 WORK SEQUENCE AND SCHEDULE

It is the design intent for the new force main to be utilized for bypassing of the existing lift station during the lift station construction period.

### 1.05 MAINTENANCE AND OPERATION OF EXISTING FACILITIES

Contractor to install 4 inch C900 PVC force main and set up temporary sewage bypass using pressure cleanout shown on the drawings and per Section 015800 before demolition of existing lift station.

### 1.06 PRECONSTRUCTION SITE VIDEO

The Contractor shall video record and document the pre-existing conditions of the job site, pipeline alignment, and properties adjacent to the project and submit the recording to the City prior to the start of construction.

### 1.07 PERMITS

- A. The following permits for the permanent work have been obtained by the Owner:
  - 1. Encroachment permit for work within the state highway (Highway 1).
  - 2. NPDES discharge permit for discharging groundwater from dewatering or water from cleaning and testing into storm drains, ditches, or surface waters, as required by the California Water Resources Control Board.
- A. The Caltrans permit obtained by the City requires the Contractor to obtain and comply with project conditions that affect the cost of project work. The

Contractor shall comply with the permit requirements and pay all fees associated with the supplementary work permits at no extra cost to the City.

- B. These additional permit requirements may include the following: (See Appendix for permit packages):
  - 1. Contractor shall apply for and obtain an encroachment permit prior to starting work, as described in the attached permit.
  - 2. Contractor shall provide Caltrans with traffic control plans for approval.
  - 3. Contractor shall provide shoring and temporary steel plate plans for approval.
- C. The Owner has or will have submitted a Notice of Intent to Discharge, along with the associated fee, under the Construction Activities Storm Water General Permit (Order WQ 2022-0057-DWQ). Under this permit the Contractor must prepare and submit Storm Water Pollution Prevention Plan.
- D. Contractor shall obtain a no-cost encroachment permit from the City of Guadalupe.
- E. Contractor shall be responsible for obtaining and paying fees for all permits, excluding those provided by City as described above, required to execute the work as defined in the contract documents, including the following if applicable:

<b>Name or Type of Permit</b>	<b>Name, Address, Telephone Number of Permitting Agency</b>
NPDES dewatering and discharge permit for discharging water for cleaning and testing into storm drains	Regional Water Quality Board, Central Coast Region 895 Aerovista Place, Suite 101 San Luis Obispo, CA 93401-7906 (805) 549-3147
State Water Resources Control Board (SWRCB) – Construction Activities Storm Water General Permit (2022-0057-DWQ) (SWPPP)	State Water Resources Control Board PO Box 100 Sacramento, CA 95812-0100 (916) 341-5536
Caltrans Encroachment Permit (Rider Permit)	Department of Transportation Encroachment Permit Office 50 Higuera Street San Luis Obispo, CA 93401-5415 (805) 549-3152

Construction Water Permit for water obtained from fire hydrants owned by City of Guadalupe	City of Guadalupe Utilities Department 918 Obispo Street Guadalupe, CA 93434
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- F. The permits contain requirements that affect the cost of project work and some permanent permits require supplementary work permits and fees to execute construction. Comply with the permit requirements and obtain and pay the fees involved with the supplementary work permits.

END OF SECTION

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## SECTION 012000 MEASUREMENT AND PAYMENT

### 1.01 WORK LISTED IN THE SCHEDULE OF WORK ITEMS

- A. Work under this contract will be paid on a unit price or lump-sum basis as outlined on the Bid Schedule for the quantity of work installed.
- B. The unit prices and lump-sum prices include full compensation for furnishing the labor, materials, tools, and equipment and doing all the work involved to complete the work included in the contract documents.
- C. The application for payment will be for a specific item based on the percentage completed or quantity installed. The percentage complete will be based on the value of the partially completed work relative to the value of the item when entirely completed and ready for service.

### 1.02 WORK NOT LISTED IN THE SCHEDULE OF WORK ITEMS

- A. The Special Provisions, general requirements, and specifications which are not listed in the schedule of work items of the Bid Form are, in general, applicable to more than one listed work item, and no separate work item is provided therefor. Include the cost of work not listed but necessary to complete the project designated in the contract documents in the various listed work items of the Bid Schedule.
- B. The bids for the work are intended to establish a total cost for the work in its entirety. Should the Contractor feel that the cost for the work has not been established by specific items in the Bid Schedule, include the cost for that work in some related bid item so that the Proposal for the project reflects the total cost for completing the work in its entirety.

### 1.03 FURNISHING AND MAINTAINING DEWATERING AND UNWATERING FACILITIES

Furnishing and maintaining dewatering and unwatering facilities for diversion and control of water during the contract period will not be paid as a separate item. The costs of furnishing and maintaining such facilities shall be included in the various listed work items of the Bid Schedule for which the dewatering and unwatering facilities are required.

### 1.04 MOBILIZATION--BID ITEM 1

Payment for mobilization (75% of bid item) shall be made at the time of the first progress payment after the Contractor has purchased bonds, insurance, obtained permits, and moved construction equipment onsite. Mobilization shall include the preconstruction video along the pipeline alignment. Payment for this item will include erosion control during construction including furnishing all labor,

equipment, materials, and doing all work associated with the Erosion Control Notes on the drawings. Payment for demobilization (25% of bid item) shall be made at the time of the final payment estimate for the applicable bid items. **Payment for this item shall not exceed 5% of the sum of the remaining bid items.**

1.05 SHEETING, SHORING, BRACING, AND EXCAVATION SAFETY MEASURES--  
BID ITEM 2

Payment for sheeting, shoring, bracing, and excavation safety measures shall be on a percent complete basis based on the lump sum amount and shall include full compensation for the labor, materials, tools, equipment, and doing all the work involved for providing sheeting and shoring and bracing for the protection of life and limb and protection of existing utilities, and shall include, but is not limited to: Complying with all applicable federal, state, and local regulations; design and stamping of shoring and/or bracing by a California Licensed Professional civil/structural engineer as required; providing jacks, trench boxes, sheets, shoring, piles, etc., as required to comply with the specifications, regulations, and the drawings; protecting in place and bracing existing utilities, including thrust blocks, high pressure gas pipelines, and overhead utility poles.

1.06 TEMPORARY BYPASSING--BID ITEM 3

Payment for this item shall be made on a percent complete basis, based on the lump sum amount for this item, and shall include full compensation for furnishing the labor, materials, tools, and equipment and doing all the work involved to implement Temporary Sewage Bypass throughout the project duration in accordance with the Contract Documents including, but not limited to: Installing, operating, and maintaining all power, primary and standby pumps, appurtenances, bypass piping, temporary piping, providing pumper trucks, clean up in the event of a spill, monitoring of bypass equipment, other work necessary to maintain existing sewer flows and services around work areas.

1.07 TRAFFIC CONTROL--BID ITEM 4

Payment for traffic control shall be made on a percent complete basis, based on the lump sum amount for this item, and shall include full compensation for furnishing the labor, materials, tools, and equipment and doing all the work involved to implement traffic regulation/control throughout the project duration in accordance with the Contract Documents, City standards, and Caltrans standards.

1.08 LIFT STATION--BID ITEM 5

- A. Payment for installation of the lift station shall be made on a percent complete basis, based on the lump sum amount for this item, and shall include full compensation for furnishing the labor, materials, tools, and equipment and doing



all the work involved in accordance with the Contract Documents including but not limited to installation of wet well, valves, vault, and associated appurtenances as shown on Sheets C-102 and C-103.

1.09 SITEWORK--BID ITEM 6

Payment for furnishing and installing Sitework shall be made on a percent complete basis, based on the lump sum amount for this item, and shall include full compensation for furnishing the labor, materials, tools, and equipment and doing all the work involved in accordance with the Contract Documents including but not limited to installation of concrete slab, fence, bollards, and site appurtenances and improvements as shown on Sheets C-102 and C-103.

1.10 DISCHARGE MANHOLE--BID ITEM 7

Payment for furnishing and installing precast concrete manholes will be made at the unit price per each manhole bid, which price shall include all costs for furnishing and installing the manholes complete, including earthwork, inside drop, and coatings, in accordance with the plans and specifications.

1.11 4 INCH C900 PVC FORCE MAIN--BID ITEM 8

Payment for furnishing and installing the force main, fittings, and thrust restraint shall be by the linear foot of 4 inch C900 PVC pipe installed. The unit cost shall include full compensation for furnishing all labor, materials, tools, and equipment and doing all work involved to provide the 4 inch C900 PVC pipe, fittings, and thrust restraint in place and operational, and the removal and replacement of existing concrete cross gutters in accordance with the Contract Documents, including any potholing per Specification Section 023219. Pothole work performed for the Contractor's convenience shall be paid as part of the Bid Item the work is in regard to. No separate payment shall be made.

1.12 8 INCH SDR35 PVC GRAVITY SEWER--BID ITEM 9

Payment for furnishing and installing the gravity sewer, fittings, and manhole penetrations shall be by the linear foot of 8" SDR35 PVC pipe installed. The unit cost shall include full compensation for furnishing all labor, materials, tools, and equipment and doing all work involved to provide the 8 inch SDR35 PVC pipe, fittings, and manhole penetrations in place and operational in accordance with the Contract Documents, including any potholing per Specification Section 023219. Pothole work performed for the Contractor's convenience shall be paid as part of the Bid Item the work is in regard to. No separate payment shall be made.

1.13 ELECTRICAL AND CONTROLS--BID ITEM 10

Payment for this lump sum bid item shall be made on a percent complete basis, based on the lump sum amount for this item, and includes full compensation for

furnishing and installing all electrical and instrumentation items as shown on the Electrical and Instrumentation Drawings and Specifications. This bid item shall include all the necessary labor, tools, materials, and equipment required to do all the work involved.

1.14 DEMOLITION--BID ITEM 11

Payment for this lump sum bid item shall be made on a percent complete basis, based on the lump sum amount for this item, and includes full compensation for demolition and salvage in accordance with the Contract Documents. This bid item shall include all the necessary labor tools, materials, and equipment required to do all the work as shown on Sheet C-101.

1.15 PAVEMENT REHABILITATION- TRENCH SECTION--BID ITEM 12

Payment for this item shall be made on a percent complete basis, based on the square foot amount for this item assuming a 24" wide trench with 12" wide full depth pavement repair sections on both sides of trench as shown on the plans. This bid item shall include full compensation for furnishing the labor, materials, tools, and equipment, and doing all the work involved to implement all pavement repair in accordance with the Contract Documents including, but not limited to: existing road demolition to extents required to facilitate construction, placement, and compaction of aggregate base, and asphalt pavement. The existing asphalt pavement section is assumed to be 4".

1.16 PAVEMENT REHABILITATION- CALTRANS ROW OVERLAY--BID ITEM 13

Payment for this item shall be made on a percent complete basis, based on the square foot amount for this item, and shall include full compensation for furnishing the labor, materials, tools, and equipment, and doing all the work involved to implement all pavement overlay within the Caltrans right-of-way in accordance with the Contract Documents including, but not limited to: existing road grinding to an assumed depth of 2.5", and placement and compaction of asphalt pavement.

END OF SECTION

## SECTION 013300 SUBMITTALS

### 1.01 RELATED WORK SPECIFIED ELSEWHERE

- A. Operation and Maintenance Manuals: 019310.

### 1.02 SHOP DRAWINGS

- A. Submit shop drawings in accordance with the Special Provisions.
- B. The use of contract drawing reproductions for shop drawings is subject to rejection.
- C. Submit five copies of shop drawings. The Owner's Representative will keep three copies and return two copies. If the Contractor desires more than two copies, he shall transfer the Owner's Representative's comments onto additional copies at his own expense. Clearly indicate the specification section and drawing number to which each shop drawing is referenced.
- D. The Owner may direct the Contractor to send all submittals to the Owner's Representative via email. Should electronic submittals be required via email, the Contractor will be required to follow the same process for each submittal required for the Work and as directed by the Owner's Representative. Provide electronic files in portable document format (PDF) for all submittals, shop drawings, product data, etc. as required for the Work and two (2) paper copies of submittals, shop drawings, product data, and samples corresponding to each electronic submittal.
- E. If the Contractor submits shop drawings of equipment by manufacturers other than those listed in the specifications, provide the following information with the submittal:
  - 1. The name and address of at least three companies or agencies that are currently using the equipment.
  - 2. The name and telephone number of at least one person at each of the above companies or agencies whom the Owner's Representative may contact.
  - 3. A description of the equipment that was installed at the above locations. The description shall be in sufficient detail to allow the Owner's Representative to compare it with the equipment that is proposed to be installed in this project.
- F. For materials originating outside of the United States for which tests are required, provide recertification and retesting by an independent domestic testing laboratory.

### 1.03 SAMPLES

- A. Furnish samples of the various materials, together with the finish thereon, as specified for and intended to be used on or in the work. Send samples to the office of the Owner's Representative, carriage prepaid.
- B. Submit samples before purchasing, fabricating, applying, or installing such materials and finishes.
- C. Submit samples, other than field samples, in duplicate. A cover letter shall accompany the sample and shall list all items being transmitted, designating their particular usage and location in the project. One sample marked "Resubmittal Not Required" will be returned to the Contractor; rejected samples will not be returned.
- D. Samples shall be submitted and resubmitted until acceptable. Materials, finishes, and workmanship in the completed project shall be equal in every respect to that of the samples so submitted and accepted.
- E. Samples shall conform to materials, fixtures, equipment, surface textures, colors, etc., as required by drawings and specifications or as requested by the Owner's Representative.
- F. Identify sample as to product, color, manufacturer, trade name, lot, style, model, etc., location of use, and contract document reference, as well as the names of the Contractor, supplier, project, and Owner's Representative.
- G. Samples shall be 8 inches by 10 inches in size and shall be limited in thickness to a minimum consistent with sample presentation. In lieu thereof, submit the actual full-size item.
- H. Samples of value may be returned to the Contractor for use in the project after review, analysis, comparison, and/or testing as may be required by the Owner's Representative.
- I. Furnish one 8-inch by 10-inch sample of the finally reviewed materials, colors, or textures to the Owner's Representative for final record. Such material samples shall carry on the back all identification as previously described including, if paint sample, manufacturer, mix, proportion, name of color, building, Contractor, subcontractor, and surfaces to which applied.

### 1.04 SUBMITTAL REQUIREMENTS

- A. Make submittals promptly in such sequence as to cause no delay in the work. Schedule submission a minimum of 30 calendar days before reviewed submittals will be needed.
- B. Submittals shall contain:

1. The date of submission and the dates of any previous submissions.
2. The project title and number.
3. Contract identification.
4. The names of:
  - a. Contractor.
  - b. Supplier.
  - c. Manufacturer.
5. Identification of the product, with the specification section number.
6. Field dimensions, clearly identified as such.
7. Relationship to adjacent or critical features of the work or materials.
8. Identification of deviations from contract documents.
9. Identification of revisions on resubmittals.
10. A 5-inch by 5-inch blank space for stamps of the Owner's Representative.
11. Contractor's stamp, initialed or signed, shall certify Contractor's review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal that the product meets the requirements of the work and of the contract documents.

#### 1.05 SUBMITTAL FORMAT

- A. Each submittal shall have a transmittal form. A sample transmittal form is included at the end of this section. Every page in a submittal shall be numbered in sequence. Each copy of a submittal shall be collated and stapled or bound, as appropriate. Copies not collated will be rejected.
- B. Where product data from a manufacturer is submitted, clearly mark which model is proposed, with all pertinent data, capacities, dimensions, clearances, diagrams, controls, connections, anchorage, and supports. Present a sufficient level of detail for assessment of compliance with the contract documents.
- C. Each submittal shall be assigned a unique number. Submittals shall be numbered sequentially and include the specification section number they correspond with. The submittal numbers shall be clearly noted on the transmittal. Original submittals shall be assigned a numeric submittal number. Resubmittals shall bear an alphanumeric system which consists of the specification section

number assigned to the original submittal for that item followed by a letter of the alphabet to represent that it is a subsequent submittal of the original. For example, if Submittal 030500 requires a resubmittal, the first resubmittal will bear the designation "030500-A" and the second resubmittal will bear the designation "030500-B" and so on.

- D. Disorganized submittals that do not meet the requirements above will be returned without review.

#### 1.06 RESUBMITTALS

Resubmittal of submittals will be reviewed and returned in the same review period as for the original submittal. It is considered reasonable that the Contractor shall make a complete and acceptable submittal by the second submission of a submittal item. The Owner's Representative reserves the right to withhold monies due to the Contractor to cover additional costs of any review beyond the second submittal.

#### 1.07 CONTRACTOR'S JOBSITE DRAWINGS

Provide and maintain on the jobsite one complete set of prints of all drawings which form a part of the contract. Immediately after each portion of the work is installed, indicate all deviations from the original design shown in the drawings either by additional sketches or ink thereon. Upon completion of the job, deliver this record set to the Owner's Representative.

# SHOP DRAWING SUBMITTAL NO.

Michael K. Nunley and Associates, Inc.

ATTN: \_\_\_\_\_

ATTN: \_\_\_\_\_

PROJECT

PROJECT NO.

OWNER PROJECT NO.

CONTRACTOR PROJECT NO.

ITEM NO.	COPIES	DESCRIPTION	PREVIOUS SUBMITTAL NO.	SPEC. SECTION NO.	PLAN SHEET NO.

SUBMITTED BY: \_\_\_\_\_

CONTRACTOR

\_\_\_\_\_ DATE

## SUBMITTAL RETURN (TO BE COMPLETED BY ENGINEER)

ITEM NO.	COPIES	RESUBMIT		COMMENTS
		YES	NO	

COPY:

RETURNED BY: \_\_\_\_\_

ENGINEER

\_\_\_\_\_ DATE

END OF SECTION

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## SECTION 015526 TRAFFIC REGULATION

### 1.01 DESCRIPTION

This section describes procedures for traffic regulation and temporary steel plate bridging during construction in public streets and highways.

### 1.02 STANDARD SPECIFICATIONS

Wherever reference is made to the State Specifications and Plans, such reference shall mean the State of California, Business, Transportation, and Housing Agency, Department of Transportation current edition Standard Specifications and Standard Plans.

### 1.03 SUBMITTALS

The Contractor shall submit, not less than fourteen (14) working days prior to start of construction operations, a plan, prepared, signed, and sealed by a California licensed traffic engineer to the City of Guadalupe and Caltrans for approval. Preparation of any additional traffic control plans or detail that may be required by the City of Guadalupe and Caltrans during the course of the work shall be the Contractor's responsibility. No work shall begin involving or requiring traffic control until a traffic control plan is approved by the City.

### 1.04 GENERAL

- A. Provide safe and continuous passage for pedestrian and vehicular traffic at all times.
- B. Control traffic at those locations indicated and in conformance with the approved traffic control plans and specifications.
- C. Furnish, construct, maintain, and remove detours, road closures, traffic signal equipment, lights, signs, barricades, fences, K-rail, flares, solar-powered flashing arrow signs, miscellaneous traffic devices, flagmen, drainage facilities, paving, and such other items and services as are necessary to adequately safeguard the public from hazard and inconvenience. All such work shall comply with the ordinances, directives, and regulations of authorities with jurisdiction over the public roads in which the construction takes place and over which detoured traffic is routed by the Contractor. After devices have been installed, maintain and keep them in good repair and working order until no longer required. Replace such devices that are lost or damaged, to such an extent as to require replacement, regardless of the cause of such loss or damage.
- D. Prior to the start of construction operations, notify the police and fire department in whose jurisdiction the project lies, giving the expected starting date, completion date, and the names and telephone numbers of two responsible

persons who may be contacted at any hour in the event of a condition requiring immediate emergency service to remove, install, relocate, and maintain warning devices. In the event these persons do not promptly respond, or the authority deems it necessary to call out other forces to accomplish emergency service, the Contractor will be held responsible for the cost of such emergency service.

- E. Post temporary "No Parking - Tow Away" signs 48 hours prior to work in areas where parking is normally permitted. The City of Guadalupe Police Department shall be notified 48 hours prior to the posting of any temporary parking restrictions along the pipeline route.
- F. Coordinate the relocation of public bus and school bus routes, bus stops, and trash collection services with the agencies listed on the plans in advance of construction activity.

#### 1.05 TRAFFIC CONTROL DEVICES AND SIGNS

- A. Traffic control devices and temporary striping shall conform to the California Manual of Uniform Traffic Control Devices (California MUTCD). Construction signs shall conform to the latest edition of the FHA publication "Standard Highway Signs" and the State of California Sign Specification Sheets.
- B. The placement of construction signing, striping, barricades, and other traffic control devices used for handling traffic and public convenience shall conform to the California MUTCD and City of Santa Maria Standard Plans. In case of discrepancy, the City of Santa Maria Standards take precedence over the California MUTCD while in the City of Guadalupe ROW and the California MUTCD Standards take precedence over the City of Santa Maria Standards while in the Caltrans ROW.
- C. Signs shall be illuminated or reflectorized when they are used during hours of darkness. Cones and portable delineators used for night lane closures shall have reflective sleeves. Equip barricades used in the diversion of traffic with flashers if in place during hours of darkness.
- D. During the duration of a detour, cover existing signs not in accordance with the traffic control plan. Relocate existing signs that are in force to provide visibility from all relocated traffic lanes.

#### 1.06 TEMPORARY STEEL PLATE BRIDGING

- A. When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal, cannot be properly completed within a workday, provide steel plate bridging with a nonskid surface and shoring to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:
  - 1. Steel plates used for bridging shall extend a minimum of 12 inches beyond the edges of the trench.

2. Install steel plate bridging to operate with minimum noise.
  3. Shore the trench to support the bridging and traffic loads.
  4. Use temporary paving with cold asphalt concrete to feather the edges of the plates if plate installation by Method 2 is used.
  5. Secure bridging against displacement by using adjustable cleats, shims, or other devices.
- B. Install steel plate bridging and shoring using either Method 1 or 2:
1. Method 1 (For Speeds More Than 45 mph): The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate.
  2. Method 2 (For Speeds 45 mph or Less): Attach approach plate(s) and ending plate (if longitudinal placement) to the roadway by a minimum of two dowels predrilled into the corners of the plate and drilled 2 inches into the pavement. Butt subsequent plates to each other. Compact fine graded asphalt concrete to form ramps, maximum slope 8.5% with a minimum 12-inch taper to cover all edges of the steel plates. When steel plates are removed, backfill the dowel holes in the pavement with either graded fines of asphalt concrete mix or concrete slurry.
- C. Maintain the steel plates, shoring, and asphalt concrete ramps.
- D. The following table shows the required thickness of steel plate bridging required for a given trench width:

<b>Trench Width (feet)</b>	<b>Minimum Plate Thickness (inches)</b>
1	1/2
1 1/2	3/4
2	7/8
3	1
4	1 1/4

- E. For spans greater than 4 feet, prepare a structural design by a registered civil engineer and submit to the Owner's Representative for review.
- F. Design steel plate bridging for HS20-44 truck loading per Caltrans Bridge Design Specifications Manual. Maintain on the steel plate a nonskid surface having a minimum coefficient of friction equivalent to 0.35 as determined by California Test Method No. 342. The Contractor may use standard steel plate with known coefficient of friction equal to or exceeding 0.35.

- G. Use a "Steel Plate Ahead" sign (W8-24) with black lettering on an orange background in advanced of steel plate bridging. This is to be used along with any other required construction signing.

#### 1.07 VEHICULAR TRAFFIC CONTROL

- A. Complete backfill, compaction, testing, and the first lift of permanent paving to a point not to exceed 500 feet behind the working heading. Shoring members, beams, or other obstructions shall not be permitted within a 2-foot clearance between the edge of excavation and the edge of any traffic lane. At construction areas where an open trench exists and/or where traffic detour will be in existence during night hours, replace delineators with barricades or K-rail.
- B. Accomplish construction in phases by detouring traffic from its normal patterns. Restore traffic to normal patterns in each phase before proceeding to the next phase.
- C. Transition traffic lane transitions from permanent lanes to construction zone patterns in accordance with the requirements for the normal posted speed limit and as shown in the drawings.
- D. Limit construction activities as allowed by the City. Return roadways and sidewalks to unrestricted vehicle and pedestrian usage when construction is not underway.
- E. During the peak traffic volume hours of the day, from 6:00 a.m. to 8:30 a.m. and 3:30 p.m. to 7:00 p.m. on weekdays only, limit construction activities within the construction zone to those which will not impact the free movement of vehicular traffic in its detoured pattern. Construction equipment or trucks shall not use or travel adjacent to traffic lanes during these time periods. Truck operations in and out of construction and staging areas shall be controlled by flagmen at all times.

#### 1.08 PEDESTRIAN TRAFFIC CONTROL

- A. Maintain and delineate a minimum of one 4-foot-wide pedestrian walkway along each public street at all times during construction. Maintain existing pedestrian accesses at intersections at all times. When existing crosswalks are blocked by construction activity, install signs directing pedestrian traffic to the nearest alternative crosswalk.
- B. Erect a fence or provide other means of securement to preclude unauthorized entry to any excavation during all nonworking hours on a 24-hour basis including weekends and holidays. Said fence shall be a minimum of 7 feet high around the entire excavation, consisting of a minimum 9-gauge chain-link type fence fabric and shall be sturdy enough to prohibit toppling by children or adults. There shall be no openings under the wire large enough for any child to crawl through. Lock any gates if no adult is in attendance. Place warning signs spaced on 50-foot centers on the outside of the fence with the statement "DEEP HOLE DANGER."

1.09 ACCESS TO ADJACENT PROPERTIES

- A. Maintain reasonable access from public streets to adjacent properties at all times during construction. Prior to restricting normal access from public streets to adjacent properties, notify each property owner or responsible person, informing him of the nature of the access restriction, the approximate duration of the restriction, and the best alternate access route for that particular property.

1.10 PERMANENT TRAFFIC CONTROL DEVICES

- A. Restriping of Streets: Permanent restriping shall be in accordance with the requirements of the agencies having jurisdiction. Place and remove temporary striping required for traffic control during construction by sandblasting. Temporary striping includes any striping required on any pavement replaced prior to the final surface course. Replace any damaged or obliterated raised pavement markers in accordance with the standards of the agency having jurisdiction.

END OF SECTION

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## SECTION 015800 TEMPORARY SEWAGE BYPASS PUMPING

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This specification covers work and equipment required for temporarily diverting sewage around work areas and interrupting flow for a short duration. Bypass pumping includes furnishing, installing, operating and maintaining all power, primary and standby pumps, appurtenances, bypass piping, and all the tools, labor, supervision, materials, and equipment necessary to maintain existing sewer flows and services and conforming with the Contractor's submitted Bypass Pumping Plan and Spill Prevention Control and Countermeasure Plan. The Contractor shall schedule work to minimize service outages.

The Contractor may perform short duration shutdowns as specified herein. Performing Short Duration Shutdowns includes furnishing, installing, operating and maintaining all power, standby pumps, appurtenances, standby piping, and all the tools, labor, supervision, materials, and equipment necessary to conform to the Contractor's submitted Short Duration Shutdown Plan and Spill Prevention Control and Countermeasure Plan. The maximum duration of a planned short duration sewer shutdown shall be 4 hours and shall occur in coordination with the City and only during the Contractor's working hours while work necessitating the shutdown is performed. In addition to submitting the shutdown plan(s), the Contractor shall provide a minimum of 72 hours written notice prior to the actual need for sewer shutdowns.

#### 1.02 SUBMITTALS

Submit a Bypass Pumping Plan, Change Over Plan, and/ or a Short Duration Shutdown Plan depending on the Contractor's plan of action.

##### A. Bypass Pumping Plan.

Submit a bypass pumping plan prepared by a licensed California Professional Engineer to the City's Representative for review a minimum of ten (10) days prior to any planned bypass. The City's written permission shall be obtained prior to bypass pumping. The bypass pumping plan shall consist of the following information, at a minimum, for each bypass pumping setup:

1. Sequence of sewage flow interruption, bypass and tie-ins.
2. Plans indicating the location of temporary sewer plugs and bypass discharge lines. Drawings shall clearly indicate the proposed intake-to-discharge

pumping sequence and shall be coordinated to minimize impact to existing plant operations.

3. Capacities of pumps, prime movers, and standby equipment. A completely redundant bypass system is required including pumps and appurtenances.
4. Design calculations proving adequacy of the system and selected equipment. This is to include any flow metering data collected, method used to establish design flows, and design flows used for sewer bypass system sizing.
5. Pump make, model, pump curve, design head (TDH) calculations, horsepower requirement, and noise rating.
6. Description of pump system controls and alarms.
7. Generator capacity, fuel requirements, tank size, and specifications (if generator is used).
8. Backup fuel and fuel capacity of internal combustion engine driven pumps.
9. Sewage bypass pipe material, fitting types, and details on necessary appurtenances, including pipe plugs.
10. Method for securing plugs to prevent floating downstream.
11. Plans showing details of proposed method of temporary handling of sewage flow, routing of bypass lines, containment areas, equipment location, schematic of pump set-up and discharge, and proposed sequencing.
12. Electrical, controls, and instrumentation.
13. Spill Prevention, control, and countermeasure plan.
14. Monitoring Plan and bypass checklist in accordance with Part 3.01 F.
15. Name and phone number (including emergency contact info) for person responsible for temporary service.
16. Decommissioning of bypass including cleaning of plugged lines.

B. Change Over Plan

Submit a written change-over plan to the Owner's Representative for review a minimum of ten (10) days prior to decommissioning any segment of the existing sewer or process equipment and/or constructing tie-in connections for new sewer or process equipment. The Owner's written permission shall be obtained prior to any shutdowns. The change-over plan shall consist of the following information, at a minimum:



1. Sequence of flow interruption, short duration shutdowns, construction of tie-ins, construction of interference manhole, and abandonment or removal of existing sewers and manholes.
2. Plans indicating the location of temporary sewer plugs, standby pump(s), discharge lines and other standby equipment.
3. Capacities of pumps and standby equipment.
4. Checklist for equipment, material and manpower required to complete the change-over in a timely fashion in conformance with the plans and specifications. All equipment, material and manpower shall be on-site and ready prior to initiating the change-over. The Contractor shall also have backup equipment and material on hand and shall be prepared to pursue the completion of the change-over in an efficient diligent and timely manner.
5. Spill Prevention, control, and countermeasure plan.

C. Short Duration Shutdown Plan

Submit a written short duration shutdown plan to the City's Representative for review a minimum of ten (10) days prior to any planned shutdowns. The City's written permission shall be obtained prior to any shutdowns. The short duration shutdown plan shall consist of the following information, at a minimum, for each setup:

1. Sequence of flow interruption and construction of tie-ins, including new manholes.
2. Location and duration of planned short duration shutdowns.
3. Plans indicating the location of temporary sewer plugs, standby pump(s), discharge lines and other standby equipment.
4. Capacities of pumps and standby equipment.
5. Checklist for equipment, material and manpower required to complete the tie-in in a timely fashion in conformance with the plans and specifications. All equipment, material and manpower shall be on-site and ready prior to initiating the sewer shutdown. The Contractor shall also have backup equipment and material on hand and shall be prepared to pursue the completion of the tie-in in an efficient diligent and timely manner.
6. Spill Prevention, control, and countermeasure plan.
7. Decommissioning of bypass including cleaning of plugged lines.

### 1.03 JOB CONDITIONS

A. Schedule the order of work to minimize bypass pumping and/or shutdown durations.

B. Protection

No bypassing to the ground surface, receiving streams, storm drains, or bypassing which may result in groundwater contamination or potential health hazards shall be permitted.

C. Bypass conditions

1. Estimated Peak Flows

a) Pioneer Lift Station: 25 gpm

2. Pioneer Lift Station to be bypassed using new force main. Contractor to provide temporary connection to new force main using inline pressure cleanout shown on plans to connect bypass pump piping. Temporary connection to be permanently removed following commissioning of the new lift station.

## PART 2 - MATERIALS

### 2.01 PUMPING EQUIPMENT

Engines shall be muffled in such a manner that the maximum noise level will not exceed 65 dBA at a distance of eight feet from motors; implement sound dampening measures as necessary. Standby pumping equipment shall be at the site continuously during bypass pumping or short duration shutdown to provide 100 percent standby pumping capacity. The standby pumps shall be connected to piping such that if the bypass duty pump fails or if interrupted sewage accumulates beyond an acceptable level, the standby pump will be online immediately.

### 2.02 BYPASS PIPING

Bypass piping shall be aluminum, galvanized steel, or fusion-welded solid wall HDPE.

## PART 3 - EXECUTION

### 3.01 SEWER BYPASSING

- A. Sewer bypassing shall be accomplished by pumping or diverting the upstream flow around the work to the inline pressure cleanout shown on the plans.
- B. Provide temporary pumps, bypass pipe, and other equipment to bypass the sewer flow. Furnish the necessary labor, tools, equipment, and supervision to set up, operate, and monitor the pumping and bypass system. Pumps and bypass lines shall be of adequate capacity and size to handle projected flows. All bypassed flow shall be discharged into a downstream manhole. Pumps shall have a sandbag berm to act as a temporary containment area.
- C. Under no circumstances shall sewage or solids be deposited onto the ground surface, streets, or into ditches, catch basins, storm drains or natural drainage ways. Sewage shall be handled in a manner so as not to create a health hazard. Swales and drainage paths in the vicinity of the bypass shall be sandbagged prior to and during bypass pumping.
- D. Maintain continuity of treatment works connected to the bypassed sewer during the execution of the work. In the event that sewage backup occurs during Contractor bypass pumping, the Contractor shall cleanup, repair, pay property damage costs, pay fines imposed by jurisdictional authorities, and handle all claims arising therefrom. All spills shall be contained and returned to the sewer system.
- E. Provide a designated employee(s) who is to be responsible for continuously monitoring the bypassing operation, and all related equipment.
- F. Complete a bypassing checklist prior to bypassing operation. The checklist will demonstrate the step-by-step inspection of the pumps, pipes, hold-down cables, plugs, and other equipment or appurtenances that will be used in the operation and sign the checklist.

### 3.02 STANDBY EQUIPMENT

Maintain on site sufficient equipment and materials to ensure continuous and successful operation of the bypass systems. Standby pumps shall be fueled and operational at all times. Maintain on site a sufficient number of valves, tees, elbows, connections, tools, sewer plugs, piping and other parts or system hardware to ensure immediate repair or modification of any part of the system as necessary.

### 3.03 SPILL PREVENTION, CONTROL AND COUNTERMEASURE PLAN

Prepare, submit and carry out a spill prevention, control and countermeasure plan that incorporates the following:

- A. Include or reference in the plan, materials provided as submittals per Part 1.02 above.
- B. Provide in the plan a description of all emergency equipment for bypassing flow, containment, cleanup, and repair of any damage. Specifics shall include as applicable, but are not limited to:
  - 1. Pipe patch kits
  - 2. Sandbags
  - 3. Rubber matting
  - 4. Bypass pipes, pumps, and other relevant equipment
  - 5. Extra pumps
  - 6. Secondary containment in trench or other surrounding land relief
- C. Maintain equipment on site.
- D. Provide the City with at least two (2) people who can be contacted 24 hours per day by phone and be at the site within 1 hour to address onsite emergencies. Provide notification of any substitution in writing at least two (2) days in advance. When bypassing flows, have at least one person available 24 hours per day to implement the emergency procedures in case of an emergency.
- E. Describe the method used to protect storm drains, waterways, and drainages during construction on the plan. The description shall include where the storm drains are located (simple map of sewer pipe, storm drains, waterways, and any relief features) and information that would assist in containing the spill. The plan shall describe how storm drains will be blocked in the event of a spill (what material, who will do it, how long it will take). Describe any other response-related plans (bypass pumping set ups, etc.).
- F. Coordinate the plan to protect water quality and respond to spills of sewage, groundwater, or fuels. Describe all spill prevention measures (e.g. monitoring of upstream manholes, monitoring in the trench).
- G. In general, good housekeeping is required so no contamination reaches surface waters or storm drains when it rains. Some specifics include, but are not limited to:

1. Prior to start of bypassing, all storm drain catch basins that are within the vicinity of the work that could possibly take in sewage in the event of a spill shall be isolated with sandbags or other approved means.
  2. Oil pans should be under any engine that leaks oil.
  3. Spill response as covered below.
- H. The following spill procedures shall be incorporated into the plan in anticipation of the described failure mode, and the Contractor shall be prepared to act accordingly. If a spill is detected or a catastrophic pipe failure occurs, the immediate priority shall be to prevent any sewage from reaching surface waters and storm drainages. Immediately protect all drainage paths using sandbags (have sandbags on site).
- I. When excavating for a new trench and moderate leaks are discovered in the existing pipe, make coupling/clamp repairs as soon as possible to minimize sewage flow into the trench. If the leak is too large to make fast coupling repair, start bypassing (see bypassing sequence below), then make repair.
4. In case of catastrophic leak, immediately start the bypassing sequence:
    - (1) Plug upstream side of manhole upstream of a catastrophic leak.
    - (2) Insert bypass pump into manhole upstream of plugged manhole. The pump shall be sized to handle peak flow of existing sewer.
    - (3) Connect hose from pump to discharge point.
    - (4) In event of any spill, immediately and in parallel with above activities, notify the City and request the City's wastewater collection staff to be dispatched. Give the best indication of the approximate size of the spill (<1,000 gallons is small; 1,000 gallons to 10,000 gallons is medium; and >10,000 gallons is large) to the City's staff so they can dispatch the appropriate response. City's staff will assist in the response and ensure that the spill is cleaned to the City's standards.
    - (5) While awaiting the City's wastewater collection staff response, pond the water in an area that can be easily and fully recovered for discharge to the City's treatment system. This ponding activity should not impact any environmentally sensitive areas.
    - (6) When City's collections staff and any other responding staff arrive onsite, a more permanent and planned response, repair,

and cleanup will ensue. Cooperate with the City to the fullest extent possible in order to minimize the impacts and volume of the spill in the most efficient manner possible.

- (7) No form of disinfection is allowed. All wash water must be contained and recovered in the same manner as the sewage.
- (8) Clean up may require equipment. All costs of City time and material and special equipment for spill cleaning will be deducted from the Contractor's progress payment.
- (9) In the event of a spill, be prepared to document the spill with a video camera and photographs. Plan on attending a debriefing immediately after the spill is contained and cleaned up.

J. Comply with the Regional Water Quality Control Board, Santa Barbara County Health Department, and Owner Standards. Cooperate with City's staff and other regulators and environmental agencies.

#### 3.04 DAMAGES

Without cost to the City, repair any damage that may result from the installation, operation, maintenance, and removal of the sewer bypass pumping system or short duration shutdown system. This includes but is not limited to damages resulting from inadequate or improper installation, operation and maintenance of the bypass or interruption system components, mechanical failures, or electrical failures.

If City staff is called on to assist, the Contractor shall pay for all costs incurred by the City in assisting the Contractor.

END OF SECTION

## SECTION 017410 CLEANING DURING CONSTRUCTION AND FINAL CLEANING

### 1.01 GENERAL

- A. This section includes cleaning during construction and final cleaning on completion of the work.
- B. At all times maintain areas covered by the contract and adjacent properties and public access roads free from accumulations of waste, debris, and rubbish caused by construction operations.
- C. Conduct cleaning and disposal operations to comply with local ordinances and antipollution laws. Do not burn or bury rubbish or waste materials on project site. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains. Do not dispose of wastes into streams or waterways.
- D. Use only cleaning materials recommended by manufacturer of surface to be cleaned.

### 1.02 CLEANING DURING CONSTRUCTION

- A. During execution of work, clean site, adjacent properties, and public access roads and dispose of waste materials, debris, and rubbish to assure that buildings, grounds, and public properties are maintained free from accumulations of waste materials and rubbish.
- B. Wet down dry materials and rubbish to lay dust and prevent blowing dust.
- C. Provide containers for collection and disposal of waste materials, debris, and rubbish.
- D. Cover or wet excavated material leaving and arriving at the site to prevent blowing dust. Clean the public access roads to the site of any material falling from the haul trucks.

### 1.03 FINAL CLEANING

- A. At the completion of work and immediately prior to final inspection, clean the entire project site as follows.
- B. Clean, sweep, wash, and polish all work and equipment including finishes.
- C. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from sight-exposed interior and exterior finished surfaces; polish surfaces.
- D. Repair, patch, and touch up marred surfaces to match adjacent surfaces.

- E. Broom clean paved surfaces; rake clean landscaped areas.
- F. Remove from the site temporary structures and materials, equipment, and appurtenances not required as a part of, or appurtenant to, the completed work.

END OF SECTION



## SECTION 018110 START UP AND PERFORMANCE ACCEPTANCE TEST PROGRAM

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

Provide planning, functional completion testing, startup and commissioning as indicated and specified.

#### 1.02 RELATED SECTIONS

- A. Temporary Sewage Bypass Pumping: 015800.

#### 1.03 REFERENCES

- A. ANSI/HI 14.6, latest edition
- B. ANSI/HI 11.6, latest edition

#### 1.04 SUBMITTALS

- A. Submit a performance acceptance testing procedure to the Owner's Representative for review at least thirty (30) days prior to systems startup, and prior to system testing.
- B. Submit plan to maintain emergency use of temporary bypassing if necessary during lift station startup and commissioning period. Submit method of providing temporary connection between lift station and new force main.

### PART 2 – MATERIALS (Not used)

### PART 3 – EXECUTION

#### 3.01 INTERFACE BETWEEN CONTRACTOR AND OWNER

It is the intent of this section that, during Preliminary Matters, System Start-Up and Performance Acceptance Testing:

- A. The ownership of the project shall remain with the Contractor.
- B. The Contractor shall perform all work necessary to test, commission, and maintain the systems provided, assuming a 24-hour working day, seven days a week, beginning seven days prior to the use of the newly constructed facilities or equipment. The Contractor shall supply all personnel required to assure all systems associated with the project are commissioned and operate according to

the specified design criteria. These systems include but are not limited to mechanical, electrical, instrumentation, controls, etc.

### C. Instrumentation Coordination

Provide personnel and equipment for the test period specified in the specifications to demonstrate that the entire Lift Station's control system functions properly.

## 3.02 LIFT STATION START-UP & FIELD TESTING

### A. Description

1. This section includes system start-up and testing for the Lift Station system. The entire system shall be operated and tested under actual operating conditions prior to project acceptance
2. Maintain temporary bypass between the lift station and new force main to facilitate emergency use of the lift station during the testing, startup and commissioning of the new lift station facilities.
3. The system shall be placed in operation by accomplishing the following three steps:
  - a. Preliminary Matters – field testing of individual components during the Contract Time, which may be accomplished one at a time.
  - b. System Start-up – starting the system under operational conditions and showing it will work for the specified length of time, which shall be accomplished before system performance acceptance testing.
  - c. Performance Acceptance Testing – proving that the entire Work will function properly as a system, each individual component shall operate within the system and that the system shall function to meet the specified standards over a stated period of time. The new lift station shall remain in uninterrupted operation for seven (7) consecutive days before requesting acceptance in writing.
4. The City will provide potable water free of charge for the Contractor's use during Preliminary Matters and System Start-up.

### B. Testing Equipment

1. Calibrate instrumentation to be used in each Performance Acceptance Test and submit proof of calibration to the Owner's Representative.
2. Install 24-hour test recorders to each motor starter for the purpose of the

tests only and remove them upon contract closeout.

C. Preliminary Matters

1. Conduct (or have previously conducted, whichever is appropriate) all field inspections as defined in the individual specification sections, installation checks, instrumentation start-up and debugging (where appropriate) hydrostatic tests, performance tests, and necessary corrections required, to demonstrate that individual components of the Work have been properly erected and found to operate in accordance with the Contract Documents, so that they can be utilized for their intended purposes.
2. Remove all electrical jumpers, bypasses, or other items connected to the equipment which are not intended to remain in the facility and are not required by the specifications other than test recorders. Demonstrate that each component is operating under its own control as designated.
3. Confirm that all electrical circuits are energized in the automatic position, that valves and gates are set to their normal position and that the flow path through the Work is unobstructed.

D. System Start-Up

1. Provide personnel and equipment as necessary during the system start-up period to perform the system start-up tasks. Coordinate preliminary matter activities with the Owner's operating personnel and the Owner's Representative prior to commencing.
2. The systems start-up will be accomplished as outlined below.
3. The system start-up for the new Pioneer Lift Station will be deemed to be completed after:
  - a. Adjustments to the control equipment and associated systems have been made.
  - b. All the system equipment is operating as specified.
4. Initiate component start-up in accordance with the manufacturer's operation and maintenance manual.
5. Coordinate with Owner's Representative for any adjustments desired or operational problems requiring debugging.
6. Make adjustments as necessary to the satisfaction of the Owner's Representative.

7. Coordinate manufacturer representative site visits to inspect the equipment and certify in writing that the equipment has been installed properly and is operating properly. This certification shall include that all auxiliary equipment has been installed properly and function in accordance with the manufacturer's specifications.
8. Operate the facilities in a manner to test alarms, controls, operating pressure, flow, interlocks, and all other auxiliary components and sub-systems. Repair or replace equipment that does not respond to the interlocks, alarms, controls and sub-systems designed. The system must operate successfully during this testing period in the manner intended. If the system does not operate successfully, correct the problem(s) and start the test over.

E. Performance Acceptance Testing (PAT)

1. Performance acceptance testing shall not proceed until the following items are completed:
  - a. Completion of Preliminary Matters and System Startup.
  - b. The written test procedure has been submitted and accepted by the Owner's Representative.
2. The design criteria for this project are fully defined in the contract documents. Confirm existing conditions with Owner's Representative.
3. After completion of the system start-up, undertake the performance acceptance testing in the presence of the Owner's Representatives. Provide all personnel and equipment as necessary during the system testing period to complete the tasks. The Owner's Representative will direct the Contractor relative to required unit operation and performance under the varying operating conditions.
4. During the performance acceptance testing period, operate the facilities in a manner to test alarms, controls, interlocks, and all auxiliary and sub-systems. Repair or replace equipment that does not respond to the interlocks, alarms, and controls designed.
5. The performance acceptance testing will be conducted for seven (7) consecutive days 24 hours per day utilizing wastewater flow entering the Lift Station. The work must operate successfully during the performance acceptance testing period in the manner intended. If the work does not operate successfully, correct the problem(s) and start the test over from day one.

6. During the performance acceptance testing, operate the pumps for the duration of the test, during which time no repairs or adjustments shall be required. Assure that pumps operate as designed and specified in response to wet well level controls and operate without evidence of vibration in excess of that allowed by the Hydraulics Institute Standards. Repair, replace, or realign motors, shafts, and impellers and retest.
7. Where field tests are required for pumps and no meters are in the associated piping, provide temporary meters and flow recorders.
8. During the performance acceptance system testing period, operate the Work, instruct designated Wastewater Collections personnel in the function and operation of the Work, and cause various operational circumstances to occur. As a minimum, these circumstances will include average and peak daily flows, random equipment failures, surcharges, and bypasses. Acceptability of the Work's performance will be based on the work performing as specified under these actual and simulated operating conditions and as defined in the contract documents. The intent is for the Contractor to demonstrate to the Owner's Representatives that the Work will function as a complete and operable system under normal as well as emergency operating conditions and is ready for acceptance.
9. Submit weekly reports to the Owner's Representative presenting performance data commencing when the system startup has commenced and ending with substantial completion of the work.

These reports shall describe the daily data of unit processes and include summaries of any equipment failures, overflows, surcharges, or any other circumstances outside of normal operations, as well as procedures to repair or otherwise correct the situation (performed or planned).

It is the intent that during the performance acceptance testing period, the Owner's Representative will evaluate these reports and estimate the performance of each unit process.

Based on these evaluations, the Owner's Representative will direct the Contractor to further investigate and correct unit processes that are believed to be performing below their expected design criteria.

10. The new lift station shall remain in uninterrupted operation for seven (7) consecutive days before requesting acceptance in writing from the Owner's Representative.

END OF SECTION

## SECTION 019310 OPERATION AND MAINTENANCE MANUALS

### 1.01 GENERAL

Submit two copies of all manufacturer's operation and maintenance manuals and data pertinent to equipment supplied for the project. Prepare and organize the material in three-ring binders with divider tabs and labels. Include a table of contents. Include a flash drive of all catalog data in pdf format and all drawings in both .pdf and CADD formats. All .pdf files shall be formatted to allow word search.

### 1.02 SUBMITTALS

#### A. Submittals shall include:

1. List of equipment furnished for project with name, address, and telephone number of each vendor.
2. List of serial numbers of equipment furnished.
3. A copy of shop drawings for mechanical, electrical, and instrument equipment in final form.
4. Manufacturer's operation and maintenance instructions and parts lists.
5. Tabulation of motor nameplate horsepower, nameplate current, field-measured current, overload relay setting, and catalog number for polyphase motors.
6. List of fuses, lamps, seals, and other expendable equipment and devices. Specify size, type, and ordering description. List name, address, e-mail address, website address, fax number, and telephone number of vendor.

#### B. Provide manuals for each piece of equipment including individual components and subsystems of complete assemblies. Line out nonapplicable text and illustrations. The section of the manual on operation shall describe the functions and limitations of each component and its relationship to the system of which it is a part. Where several models, options, or styles are described, the manual shall identify the items actually provided.

#### C. Each manual shall contain the following:

1. Manufacturer's identification, including order number, model, and serial number.
2. Blue line prints or reviewed shop drawings and diagrams of all systems.

3. Certified equipment drawings or reviewed shop drawing data clearly marked for equipment furnished.
  4. Complete operating and maintenance instructions for each and every item of equipment, setting forth in detail and step-by-step the procedure for starting, stopping, operating, and maintaining the entire system as installed. Include a schedule of recommended maintenance intervals.
  5. Complete parts list of replaceable parts, their part numbers, and the name and address of their nearest vendor.
  6. A complete valve tag list including the name and function of the pipe in which the valve is mounted.
  7. Any special emergency operating instruction and a list of service organizations (including addresses and telephone numbers) capable of rendering emergency service to the various parts of the system.
  8. Copy of manufacturer's equipment guarantees and warranties.
- D. Brochures shall be loose leaf with durable plastic or fiberboard covers. Each sheet shall be reinforced to prevent tearing from continued use, and each brochure shall have the following information clearly printed on its cover:
1. Project name, name of Owner, and address.
  2. Name and address of Owner's Representative.
  3. Name and addresses of contractors and subcontractors and department to contact.
  4. Telephone number of contractors, including night and emergency numbers.
  5. Major equipment vendors' names and telephone numbers.
- E. Submit complete manuals at least four weeks before the date of the instructions required by the subsections on "Manufacturer's Services" in the various specification sections.
- F. Operation and maintenance manuals specified herein are in addition to any operation, maintenance, or installation instructions required by the Contractor to install, test, and start up equipment.

### 1.03 EQUIPMENT DATA SHEETS

Provide two sets of equipment data sheets, bound in three-ring binders, summarizing the equipment manufacturer's maintenance instructions and recommendations. A blank data sheet and a sample data sheet are attached.

Preventive Maintenance and Operating Requirement Sheets

Preventive Maintenance Program	Equipment Record Number	
EQUIPMENT DESCRIPTION	ELECTRICAL OR MECHANICAL DATA	
Name:	Size:	
Serial No.:	Model:	
Vendor:		
Vendor Address:	Type:	
	Mfr.:	
Vendor Rep:	Voltage:	Amps:
Phone:	Phase:	rpm:
Maintenance Work to be Done	Frequency*	
OPERATING REQUIREMENTS AND REFERENCE		

\*D - Daily; W - Weekly; B - Biweekly; M - Monthly; Q - Quarterly;  
S - Semiannually; A - Annually.



SAMPLE

Preventive Maintenance and Operating Requirement Sheets

Preventive Maintenance Program	Equipment Record Number	
EQUIPMENT DESCRIPTION	ELECTRICAL OR MECHANICAL DATA	
Name: Influent Pump No. 1 Tag No.: P01-1	Size: 15 hp	
Serial No.: 123456ABC	Model: 140T Frame Serial No. 987654ZY Class F Insulation W/Space Heater	
Vendor: ABC Pump Co.		
Vendor Address:  1111 Pump Circle Newport Beach, CA 92663	Type:	
	Mfr.: DEF Motors, Inc.	
Vendor Rep: XYZ Equipment, Inc.	Voltage: 460	Amps: 20
Phone: 714/752-0505	Phase: 3	rpm: 1,800
Maintenance Work to be Done		Frequency*
1. Operate all valves and check such things as a) bearing temperature, b) changes in running sound, c) suction and discharge gauge readings, d) pump discharge rate, and e) general condition of the drive equipment.		D
2. Check packing.		D
3. Checking pumping unit for any dust, dirt, or debris.		W
(Continued on attached sheet)		
<b>OPERATING REQUIREMENTS AND REFERENCE</b>		
For manufacturer's instructions regarding installation, operation, maintenance, and trouble shooting of this equipment, see Volume ____, Section _____.		

\*D - Daily; W - Weekly; B - Biweekly; M - Monthly; Q - Quarterly;  
S - Semiannually; A - Annually.

SAMPLE

Preventive Maintenance and Operating Requirement Sheets

Preventive Maintenance Program		Equipment Record Number	
EQUIPMENT DESCRIPTION		ELECTRICAL OR MECHANICAL DATA	
Name:		Size:	
Serial No.:		Model:	
Vendor:			
Vendor Address:		Type:	
		Mfr.:	
Vendor Rep:		Voltage:	Amps:
Phone:		Phase:	rpm:
Maintenance Work to be Done			Frequency*
4. Lubricate bearing frame and motor bearings (consult manufacturer's instructions for type of grease or oil).			Q
5. Disassemble and change or repair the following: a) impeller, b) shafts, c) shaft sleeve, d) rotary seals, and e) sleeve bearings.			A
OPERATING REQUIREMENTS AND REFERENCE			

\*D - Daily; W - Weekly; B - Biweekly; M - Monthly; Q - Quarterly;  
S - Semiannually; A - Annually.

END OF SECTION

## SECTION 020120 PROTECTING EXISTING UNDERGROUND UTILITIES

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials and procedures for protecting existing underground utilities.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Trenching, Backfilling, and Compacting: 312316.
- B. Subsurface Utility Locating (Potholing): 023219.

### PART 2- MATERIALS

#### 2.01 REPLACEMENT IN KIND

Except as indicated below or as specifically authorized by the Owner's Representative, reconstruct utilities with new material of the same size, type, and quality as that removed.

#### 2.02 VITRIFIED CLAY SEWER PIPE AND COUPLINGS

For sewer pipe 8 inches and less in diameter, replacement shall consist of SDR 35 PVC sewer pipe conforming to ASTM D3034. Compression couplings shall be 5000 Series Strong Back RC Couplings by Fernco, or equal. Use only one section of pipe in crossing the trench section.

### PART 3- EXECUTION

#### 3.01 GENERAL

- A. Replace in kind street improvements, such as curbs and gutters, barricades, traffic islands, signalization, fences, signs, etc., that are cut, removed, damaged, or otherwise disturbed by the construction.
- B. Where utilities are parallel to or cross the construction but do not conflict with the permanent work to be constructed, follow the procedures given below. Notify the utility owner 48 hours in advance of the crossing construction and coordinate the construction schedule with the utility owner's requirements. For utility crossings not shown in the drawings, refer to the General Conditions and the instructions of the Owner's Representative for guidance.

- C. Determine the true location and depth of utilities and service connections which may be affected by or affect the work. Determine the type, material, and condition of these utilities. In order to provide sufficient lead-time to resolve unforeseen conflicts, order materials and take appropriate measures to ensure that there is no delay in work.

### 3.02 PROCEDURES

- A. **Protect in Place:** Protect utilities in place, unless abandoned, and maintain the utility in service, unless otherwise specified in the drawings or in the specifications.
- B. **Cut and Plug Ends:** Cut abandoned utility lines and plug the ends. Plug storm drains and sewers with an 8 inch wall of brick and mortar. Cap waterlines with a cast-iron cap or install a 3-foot-long concrete plug. Dispose of the cut pipe as unsuitable material.
- C. **Remove and Reconstruct:** Where so indicated in the drawings or as required by the Owner's Representative, remove the utility and, after passage, reconstruct it with new materials. Provide temporary service for the disconnected utility.

### 3.03 COMPACTION

- A. **Utilities Protected in Place:** Backfill and compact under and around the utility so that no voids are left.
- B. **Utilities Reconstructed:** Prior to replacement of the utility, backfill the trench and compact to an elevation 1 foot above the top of the ends of the utility. Excavate a cross trench of the proper width for the utility and lay, backfill, and compact.
- C. **Alternative Construction--Sand-Cement Slurry:** Sand-cement slurry consisting of one sack (94 pounds) of portland cement per cubic yard of sand and sufficient moisture for workability may be substituted for other backfill materials to aid in reducing compaction difficulties. Submit specific methods and procedures for the review of the Owner's Representative prior to construction.

### 3.04 THRUST BLOCKS ON WATERLINES

- A. The Contractor's attention is called to thrust blocks for waterlines throughout the project whose thrust is in the direction of the new excavation and, therefore, may be affected by the construction. These waterlines are owned and operated by the Owner. Protect thrust blocks in place or shore to resist the thrust by a means approved by the Owner's water division superintendent and reconstruct. If the thrust blocks are exposed or rendered to be ineffective in the opinion of the Owner's Representative, reconstruct them to bear against firm unexcavated soil or backfill material.

- B. Provide firm support by backfilling that portion of the trench for a distance of 2 feet on each side of the thrust block to be reconstructed from the pipe bedding to the pavement subgrade, with either:
  - 1. Sand-cement slurry (94 pounds of cement per cubic yard).
  - 2. The native material compacted to a relative compaction of 95%.
- C. Then excavate the backfill material for construction of the thrust block.
- D. Test compaction of the backfill material before pouring any concrete thrust block. Use Class C concrete per Section 030500 for reconstruction.

END OF SECTION

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## SECTION 023219 SUBSURFACE UTILITY LOCATING (POTHOLING)

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials and procedures for performing pothole operations to locate existing underground utilities.

#### 1.02 SUBMITTALS

- A. Submit request for pre-marking of pothole locations at least five (5) calendar days prior to the commencement of field activities.
- B. Submit a traffic control/protection plan per Specification Section 015526.
- C. Submit proposed method of potholing, including description of equipment to be used, and schedule for potholing for approval at least seven (7) calendar days prior to the commencement of field activities. Obtain Owner's approval of pothole locations prior to commencement of field activities.
- D. Submit field logs to the Owner within two (2) working days after the completion of pothole excavations in each area. Include dates of potholing operations and any additional discovered information or pertinent data. Include for each pothole excavation field log:
  - 1. Pothole number.
  - 2. Date of pothole.
  - 3. Depths to top and bottom of utility (measured from existing grade over utility at pothole).
  - 4. Miscellaneous Contractor's notes.
- E. Submit temporary steel cap and/or steel plate bridging shop drawings at least seven (7) calendar days prior to the commencement of field activities.
- F. Submit sand-cement slurry mix design at least seven (7) calendar days prior to the commencement of field activities.
- G. Submit asphalt concrete mix design at least seven (7) calendar days prior to the commencement of field activities.

## 1.03 PROCEDURES

- A. Subsurface utility-locating (potholing) services shall conform to CI/ASCE 38-22. For the purpose of this scope, "locate" means to obtain the horizontal and vertical position of the utility line by excavating a circular test hole or narrow trench (where approved of and/or requested by the Owner). Construct test holes using vacuum excavation or comparable nondestructive equipment in a manner that will cause no damage to the utility.
- B. Subsurface utility locating shall consist of test hole excavations at locations indicated on the pothole plans as approved by the Owner. Narrow trench excavations (slot potholes) may be required at locations approved by the Owner or to locate multiple parallel utilities.

## 1.04 STATE STANDARD SPECIFICATIONS

Wherever reference is made to the State Specifications such reference shall mean the State of California, Business, Transportation, and Housing Agency, Department of Transportation Standard Specifications, current edition.

## PART 2- MATERIALS

### 2.01 SAND-CEMENT SLURRY BACKFILL AT TEST HOLES AND AT EXPLORATORY TRENCHES

Sand-cement slurry backfill shall consist of two sacks of Type I or II Portland Cement added per cubic yard of imported sand and sufficient water for workability.

### 2.02 ASPHALT CONCRETE PAVEMENT REPAIR AT TEST HOLES

- A. Asphalt shall be ½ inch maximum, Type A HMA, with PG64-10 binder, meeting the requirements of Section 39 of the Caltrans Standard Specifications. Asphalt content in the pavement shall be 5.5% to 6.0%.
- B. Aggregate shall conform to the requirements of Section 26, Class 2, ¾ inch maximum of the Caltrans Standard Specifications.
- C. Paving thickness shall match existing plus 1 inch.

## PART 3- EXECUTION

### 3.01 POTHOLING OPERATIONS

- A. Backfill and repair test hole excavations immediately after obtaining the measurement data. Backfill and repair trench excavations requiring use of



temporary steel plate bridging within four (4) working days. Advise Owner of number of pothole excavations completed and number remaining.

- B. Underground Service Alert Requirements: Comply with Underground Service Alert requirements for notification prior to excavation. Contact Underground Service Alert at 1-800-642-2444 (or dial 811) no less than two and no more than ten working days prior to the start of exploratory excavation. Verify whether or not a representative of each utility or agency will be present during excavation, and coordinate with said individual(s). Take any precautions required by the utility owner.
- C. Conduct potholing operations in a manner that minimizes the damage potential to existing underground utilities in order to ensure that the existing facilities will remain in operation without interruption.
- D. Pothole excavations shall sufficiently expose subsurface utilities to allow surveyor to easily determine and measure the following data:
  - 1. Elevation at top and bottom of utility.
  - 2. Elevation of existing grade over utility at pothole.
  - 3. Coordinates at surface.
  - 4. Outside diameter of utility or width of duct banks.
  - 5. Utility material and condition.
- E. Location and Depiction of Existing Utilities: Pothole maps for subsurface utility locating shall be present and utilized during potholing activities. The plans shall be compared to utility/agency paint markings following Underground Service Alert notification. If discrepancies are found between the plans and paint markings, promptly notify the Owner prior to commencement of any excavation

### 3.02 EXCAVATION

- A. Protect utilities or underground structures from damage during potholing. Immediately report any damaged utilities to the affected utility's owner and the Owner. Repair immediately any damaged utilities in accordance with the respective utility owner's requirements. Neatly cut and remove existing pavement. Excavate test holes in such a manner as to prevent any damage to wrappings, coatings, or other protective coverings, utilizing vacuum excavation or hand digging.
- B. Methods: Backhoe excavation is not permitted except for trench excavations. Use the following methods for pothole excavations:

1. Hand Digging: Hand digging is the method of excavating a pothole by manual means with hand-held, nonmechanical equipment such as a shovel.
  2. Vacuum Excavation: Vacuum excavation shall consist of air or water pressure to break up the soil and a vacuum device to collect the spoils. Determine if air or water vacuum excavation shall be used depending upon specific site and environmental characteristics. Soil type such as heavy clay may require water vacuum excavation. Utilize air vacuum excavators if mud from water vacuum excavators cannot be disposed properly. Use air vacuum excavators if damage to utilities, such as cutting through cables, will occur with the use of water vacuum excavators. Limit vacuum pressure of equipment as to not cause damage to utilities.
    - a. Air: Air vacuum excavators shall utilize a high velocity air stream to penetrate, expand, and break up the soil. Remove the loosened particles of soil and rock from the excavation through the use of a vacuum.
    - b. Water: Water vacuum excavation systems shall excavate the pothole using high-pressure water to reduce and loosen the soil. Remove the wet soil and mud slurry to a spoil tank using a vacuum.
- C. Size of Test Hole Excavation: Maximum test hole size shall be 8 inches in diameter at surface, unless indicated otherwise by Owner.
- D. Size of Exploratory Trench Excavation: Trench width and length shall be as approved by the Owner. Trench depth shall be as required to accurately locate subsurface utilities.
- 3.03 TEMPORARY STEEL PLATE BRIDGING, WITH A NONSKID SURFACE (WHERE REQUIRED FOR APPROVED TRENCHES)
- A. Provide steel plate bridging with a nonskid surface and shoring to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:
1. Steel plates used for bridging shall extend a minimum of 12 inches beyond the edges of the trench.
  2. Install steel plate bridging to operate with minimum noise.
  3. Shore the trench to support the bridging and traffic loads.
  4. Use temporary paving with cold asphalt concrete to feather the edges of the plates.
  5. Secure bridging against displacement by using adjustable cleats, shims, or other devices.

- B. Install steel plate bridging and shoring using the following method:

Attach approach plate(s) and ending plate (if longitudinal placement) to the roadway by a minimum of two dowels predrilled into the corners of the plate and drilled 2 inches into the pavement. Abut subsequent plates to each other. Compact fine graded asphalt concrete to form ramps, maximum slope 8.5% with a minimum 12-inch taper to cover all edges of the steel plates. When steel plates are removed, backfill the dowel holes in the pavement with either graded fines of asphalt concrete mix or concrete slurry.

- C. Maintain the steel plates, shoring, and asphalt concrete ramps.
- D. Unless specified, use of steel plate bridging at any given location shall not exceed four (4) consecutive working days in any given week. Cover backfilling of excavation with a minimum of 3 inches of temporary layer of cold mix asphalt concrete.
- E. The following table shows the required minimal thickness of steel plate bridging required for a given trench width:

<b>Trench Width (feet)</b>	<b>Minimum Plate Thickness (inches)</b>
1	1/2
1 1/2	3/4

- F. The Contractor may use standard steel plate with known coefficient of friction equal to or exceeding 0.35.
- G. Use a “Steel Plate Ahead” sign (W8-24) with black lettering on an orange background in advanced of steel plate bridging. This is to be used along with any other required construction signing.

### 3.04 POTHOLE REPAIR

- A. Following data gathering, backfill excavation with approved material as follows:
  1. Test Hole Excavations: Sand-cement slurry backfill per Part 2 of this section. Bring to grade with asphalt cement pavement per Part 2 of this section. Match existing pavement thickness plus 1 inch.
  2. Exploratory Trenches: Backfill per Part 2 of this section. Match existing pavement thickness plus 1 inch.
- B. The finished surface of the repair shall be of like material and constructed to the same finished grade as the adjacent pavement. The finished surface shall be such that it does not allow water to pond. There shall be no discernable

difference in surface level at the joint between the existing pavement and the completed repair.

### 3.05 DISPOSAL OF CUTTINGS

Dispose of cuttings off-site.

END OF SECTION

## SECTION 024100 EQUIPMENT, PIPING, AND MATERIALS DEMOLITION

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section describes demolition, removal, abandonment, and relocation of existing mechanical and electrical equipment and piping.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Protecting Existing Underground Utilities: 020120.
- B. Earthwork: 312300.

### PART 2- MATERIALS

Refer to other sections of these specifications for material to be used as replacements for removal or abandoned equipment.

### PART 3- EXECUTION

#### 3.01 GENERAL

Perform removal, replacement, abandonment, relocation, and demolition work specified and indicated in the drawings. Prepare remaining surfaces to receive new scheduled and specified materials and finishes or finish to match adjacent surfaces if no additional work is scheduled or indicated.

#### 3.02 REMOVAL AND REPLACEMENT

- A. Remove equipment indicated in the drawings.
- B. Replace equipment indicated in the drawings

#### 3.03 ABANDONMENT

Abandon in place equipment indicated in the drawing or listed herein.

#### 3.04 RELOCATION

Relocate the following equipment to the designated location:

<b>Equipment Description</b>	<b>Present Location</b>	<b>New Location</b>
Water Meter	Inside existing lift station fence, in front of building on north side.	Outside of new security fence near northeastern corner
Water Service Lateral	From Pioneer Street waterline to existing water meter location	From Pioneer Street waterline to new water meter location
PGE Meter	Inside existing lift station fence, in front of building on South side.	See Electrical Sheets

### 3.05 SHUTDOWNS OF EXISTING PIPING AND ELECTRICAL UTILITIES

Shut off or disconnect utilities affecting demolition work. Schedule shutdowns with the Owner. Notify the Owner three (3) working days in advance of any shutdown that is required to perform the work.

### 3.06 TEMPORARY SUPPORT OF EXISTING EXPOSED PIPING

- A. Provide temporary support for existing piping that must be kept in service during demolition of adjacent piping or other existing work in the project. Do not block access to the adjacent valves, equipment, or access door and stairways with the temporary supports.

### 3.07 PLUGGING ABANDONED PIPING

Plug buried pipes 6 inches and larger to be abandoned. Plug pipes of all sizes to be abandoned under structures. Plug by placing a 3-foot-long concrete plug in the open ends.

### 3.08 REMOVAL OR RELOCATION OF ELECTRICAL MATERIALS AND EQUIPMENT

- A. Unless otherwise noted, remove existing electrical materials and equipment from areas indicated for demolition or where equipment is to be relocated. Disconnect circuits at their source. Remove materials no longer used, such as studs, straps, and conduits. Remove or cut off concealed or embedded conduit, boxes, or other materials and equipment to a point at least 3/4 inch below the final finished surface. Remove existing unused wires.
- B. Repair affected surfaces to conform to the type, quality, and finish of the surrounding surface.

### 3.09 TRANSFORMERS AND OTHER ELECTRICAL APPARATUS

Transformers, switches, capacitors, resistors, and/or other liquid-filled electrical apparatus that will be removed under this contract may contain PCBs. It is the Contractor's responsibility to identify the presence of PCBs and to dispose of them in compliance with all local, state, and federal laws, regulations, and ordinances.

### 3.10 PATCHING

- A. Patching shall mean the restoration of a surface or item to a condition as near as practicable to match the existing adjoining surfaces unless otherwise noted, detailed, or specified.
- B. When patching involves painting, special coating, vinyl fabric, or other applied finish, refinish the entire surface plane (i.e., wall or ceiling), unless complete refinishing of the entire space is scheduled or specified.
- C. Patching includes cleaning of soiled surfaces.

### 3.11 DEMOLITION

- A. Existing buildings, structures, boxes, pipes, pavements, curbs, and other items are to be removed, altered, salvaged, and disposed of as specified herein or indicated in the drawings. Remove and dispose of all portions of these items that interfere with project construction.
- B. Remove and dispose offsite facilities to be demolished in their entirety including belowground footings, foundations, and other associated appurtenances, as shown in the drawings or as specified herein. Backfill and compact all site areas disturbed by demolition work with earth backfill or gravel material in accordance with Section 312300.
- C. Perform the work in a manner that will not damage parts of the structure not intended to be removed or to be salvaged for the Owner. If in the opinion of the Owner's Representative, the method of demolition used may endanger or damage parts of the structure or affect the satisfactory operation of the facilities, promptly change the method when so notified by the Owner's Representative. No blasting will be permitted.
- D. Equipment, material, and piping, except as specified to be salvaged for the Owner, or removed by others, within the limits of the demolition, excavations, and backfills, will become the property of the Contractor and shall be removed from the project site. The salvage value of this equipment, materials, and piping shall be reflected in the contract price of the demolition work.
- E. Do not reuse material salvaged from demolition work on this project, except as specifically shown.

END OF SECTION



## SECTION 030500 GENERAL CONCRETE CONSTRUCTION

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, installation, and testing of formwork, reinforcing steel, joints, concrete, and finishing and curing for general concrete construction.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Painting and Coating: 099000.
- B. Chemical-Resistant Coatings for Concrete: 099720.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Prepare concrete and mortar mix designs and laboratory 7-day and 28-day compressive tests or submit test reports of 7-day and 28-day compressive tests of the mix where the same mix has been used on two previous projects. Submit mix design in writing for review by the Owner at least fifteen (15) days before placing of any concrete.
- C. Submit mill test certificates identifying chemical and physical analyses of each load of reinforcing steel delivered. If mill test reports are unavailable and the quantity of steel for a structure exceeds 5 tons, provide a laboratory test to prove conformance with the specified ASTM standard.
- D. Submit reinforcing bending lists and placing drawings for all reinforcing. Placing drawings shall indicate all openings (mechanical, electrical, equipment, and architectural) including additional reinforcing at openings and corner bar arrangements at intersecting beams, walls, and footings indicated in the Drawings. Placing drawings shall be coordinated with the concrete placing schedule. Each bending list and placing drawing submitted shall be complete for each major element of a structure (grade slabs, footings, walls, deck, floor, or roof slabs) including dowels and corner bars. Furnishing such lists shall not be construed that the lists will be reviewed for accuracy. The Contractor shall be wholly and completely responsible for the accuracy of the lists and for furnishing and placing reinforcing steel in accordance with the details shown in the drawings and as specified. Placing drawings shall be prepared by the Contractor and shall not incorporate photocopies of the contract drawings.

- E. Submit an electronic copy in PDF format of a report from a testing laboratory verifying that aggregate material contains less than 0.25% asbestos by weight or volume and conforms to the specified gradations or characteristics.

## PART 2- MATERIALS

### 2.01 NONDOMESTIC CEMENT AND ADDITIVES

- A. The use of nondomestic cement and additives in concrete may be permitted only after review of a written request to use such materials. The request to use nondomestic materials shall include a chemical analysis that indicates the material meets the project specifications. Certifications that state the nondomestic materials meet the project requirements will not be accepted.
- B. Test reports for concrete materials shall be current within three months of inclusion into the project and shall be identifiable to the materials supplied.

### 2.02 FORMWORK

- A. Design forms according to ACI 347, latest edition.
- B. Class I Forms: Use steel forms or smooth-surface plywood 3/4-inch minimum thickness for straight surfaces and 1/2-inch minimum thickness for curved surfaces.
- C. Class II Forms: Use plywood in good condition, metal, or smooth-planed boards free from large or loose knots with tongue and groove or ship lap joints.
- D. Class II forms may be used for exterior concrete surfaces that are 1 foot or more below finished grade. Use Class I forms for all other surfaces.
- E. Coat forms with form release agent.

### 2.03 BOND BREAKER

Bond breaker shall be a nonstaining type which will provide a positive bond prevention, such as Silcoseal 77, as manufactured by Nox-Crete; or equal.

### 2.04 FORM RELEASE AGENT

- A. Form release agent shall effectively prevent absorption of moisture and prevent bond with the concrete. Agent shall be nonstaining and nontoxic after 30 days.
- B. For steel forms, release agent shall prevent discoloration of the concrete due to rust.

2.05 REINFORCING STEEL

- A. Reinforcement shall conform to ASTM A615 or A706, Grade 60.
- B. Fabricate reinforcing in accordance with the current edition of the Manual of Standard Practice, published by the Concrete Reinforcing Steel Institute. Bend reinforcing steel cold.
- C. Deliver reinforcing steel to the site bundled and with identifying tags.

2.06 TIE WIRE

Tie wire shall be 16 gauge minimum, black, soft annealed.

2.07 BAR SUPPORTS

Bar supports in beams and slabs exposed to view after form stripping shall be galvanized and plastic coated. Use concrete supports for reinforcing in concrete placed on grade.

2.08 BAR COUPLERS

Reinforcing steel bar splicing couplers shall be a mechanical type as manufactured by Dayton Barsplice, Inc. or equal. Use couplers that do not reduce tensile or ultimate strength of bars.

2.09 JOINT SEALANT FOR CONCRETE STRUCTURES

- A. Joint sealant shall be a multipart, gray, nonstaining, non-sagging, gun grade polyurethane sealant, which cures at ambient temperature to a firm, flexible, resilient, tear-resistant rubber. Sealant shall comply with ASTM C920, Type M, Grade P, Class 35 for horizontal joints and Grade NS, Class 25 for vertical joints and be recommended by the manufacturer for continuous immersion in water.

<b>Characteristic or Parameter</b>	<b>Technical Requirements</b>
Pot life	1 to 3 hours
Hardness	35 Shore A, $\pm 5$ , ASTM D2240
Elongation	300-600%, ASTM D412
Tensile strength	200 psi, ASTM D412
Peel strength on concrete	No adhesion loss at 25 pounds
Temperature service range	40°F to 167°F
Immersion in water	Continuous

- B. Sealant shall be Tremco Vulkem 227 or Sikaflex-2CNS (for Grade NS, Class 25), Sikaflex-2CSL of Sika Corporation or Vulkem 445SSL (for Type M, Grade P, Class 35), or equal. Troweling of sealants into joints will not be permitted.

## 2.10 BACKING ROD FOR EXPANSION JOINTS

Backing rod shall be an extruded closed-cell polyethylene foam rod, such as Ethafoam SB, as manufactured by Dow Chemical Company, or equal. The rod shall be 1/4 inch larger in diameter than the joint width. Where possible, provide full-length sections for the joint; minimize splices. Apply backup rod and bond breaker tape in expansion joints.

## 2.11 BOND BREAKER TAPE

Bond breaker tape shall be an adhesive-backed glazed butyl or polyethylene tape that will adhere to the pre-molded joint material or concrete surface. The tape shall be the same width as the joint. The tape shall be compatible with the sealant.

## 2.12 PREFORMED CONTROL JOINT

Preformed control joint shall be a one-piece, flexible, PVC joint former, or a one-piece steel strip with preformed groove. Provide the preformed control joint material in full-length, un-spliced pieces.

## 2.13 PREMOLDED JOINT FILLER

Joint filler shall be preformed, non-extruded type constructed of closed-cell neoprene conforming to ASTM D1752, Type I, as manufactured by W. R. Meadows, Inc., or equal or bituminous-type preformed expansion joint filler conforming to ASTM D994.

## 2.14 STEEL EXPANSION JOINT DOWELS

- A. Steel expansion joint dowels shall conform to one of the following:
  - 1. Steel bar dowels with a 12-mil-thick epoxy coating. Steel bar dowels shall conform to ASTM A36 or ASTM 615, plain rounds, Grade 40. Epoxy coating shall be in conformance with ASTM A775.
  - 2. Stainless steel bar dowels conforming to ASTM A276, Type 302.
- B. Exposed portion of expansion joint dowels shall be thoroughly greased prior to casting of adjoining wall or slab.

## 2.15 CEMENT

- A. Use domestic portland cement that conforms to ASTM C150, Type II/IV.

- B. Use only one brand of cement in any individual structure. Use no cement that has become damaged, partially set, lumpy, or caked. Reject the entire contents of the sack or container that contains such cement. Use no salvaged or reclaimed cement.
- C. Maximum tricalcium aluminate shall not exceed 8%. The maximum percent alkalis shall not exceed 0.6%.

## 2.16 AGGREGATES

Aggregates shall be natural rock, sand, or crushed natural rock and shall comply with ASTM C33 and shall contain less than 0.25% asbestos by weight or volume. Aggregates shall be free from any substances that will react with the cement alkalis, as determined by Appendix X-1 of ASTM C33.

## 2.17 WATER AND ICE

Use water and ice that is clean and free from objectionable quantities of organic matter, alkali, salts, and other impurities that might reduce the strength, durability, or otherwise adversely affect the quality of the concrete. Water shall not contain more than 500 mg/L of chlorides or more than 500 mg/L of sulfate.

## 2.18 CONCRETE ADMIXTURES

- A. Class A concrete shall contain an air-entraining admixture conforming to ASTM C260. Admixtures shall be Master Builders MB-AE 90, Sika AER, or equal.
- B. Class A concrete shall contain a water-reducing admixture conforming to ASTM C494, Type A. It shall be compatible with the air-entraining admixtures. The amount of admixture added to the concrete shall be in accordance with the manufacturer's recommendations. Admixture shall be Master Builders Pozzolite polymer-type normal setting, Sika Plastocrete 161 or Plastiment, or equal.
- C. Mineral Admixture: Class A concrete shall contain a mineral admixture, fly ash Class F, conforming to ASTM C618, not to exceed or replace more than 15% of the cement material required without the mineral admixture.
- D. Do not use any admixture that contains chlorides or other corrosive elements in any concrete. Admixtures shall be nontoxic after 30 days.

## 2.19 GROUT

- A. Nonshrink grout shall conform to ASTM C1107 and to these specifications. Use a nongas-liberating type, cement base, premixed product requiring only the addition of water for the required consistency. Grout shall be Euclid Chemical Hi-Flow Grout, Master Builders MasterFlow 928 Grout, or equal. Components shall be inorganic.

- B. Ordinary type grout (dry pack) shall consist of one-part portland cement to two parts sand (100% passing a No. 8 sieve). Add sufficient water to form a damp formable consistency.
- C. Expansive Grout: Premixed, cementitious mixture with a minimum 28-day strength of 3,500 psi. Provide air-entraining admixture as recommended by the manufacturer.
- D. Epoxy Grout:
  - 1. Mix the two components of epoxy bonding compound in compliance with the manufacturer's instructions.
  - 2. Use sand that is oven dry and meets the following gradation requirements for epoxy grout:

<b>Sieve Size</b>	<b>No. 8</b>	<b>No. 50</b>	<b>No. 100</b>
% Passing	100	30 ±15	5 ±5

2.20 GROUT BEDDING FOR HORIZONTAL JOINTS

The grout placed on horizontal construction joints shall be a mixture of cement, sand, and water in the same proportions and strength used in the overplaced concrete with coarse aggregate omitted.

2.21 REPAIR MATERIALS

- A. Repair materials shall be used to fill voids, bugholes, structurally reinforce and/or rebuild surfaces, etc. as determined necessary by the engineer and protective coating applicator. Repair materials must be compatible with the specified coating and shall be applied in accordance with the manufacturer's recommendations.
- B. The following products may be accepted and approved as compatible repair basecoat materials for approved topcoating for use within the specifications:
  - 1. 100% solids, solvent-free grout specifically formulated for approved topcoating compatibility. The grout manufacturer shall provide instructions for trowel or spray application and for approved topcoating procedures.
  - 2. Factory blended, rapid setting, high early strength, non-shrink cementitious or epoxy repair mortar that can be trowelled or pneumatically spray applied may be approved if specifically formulated to be suitable for approved topcoating. Such repair mortars should not be used unless their manufacturer provides information as to its suitability for topcoating with the approved topcoating. Project specific submittals should be provided

including application, cure time and surface preparation procedures which permit optimum bond strength with the approved coating.

2.22 BONDING COMPOUND

- A. Epoxy bonding compound shall be Sikadur 32 Hi-Mod, MasterBrace 2200 by BASF; Euco Epoxy 452 by Euclid Chemical Company; or equal.
- B. Non epoxy bonding compound shall be Weldcrete by Larsen Products Corp., Euco Weld by Euclid Chemical Co., or equal. The compound shall be re-wettable for up to two weeks.

2.23 CONCRETE MIX DESIGN

- A. Conform to ASTM C94, except as modified by these specifications.
- B. Air content as determined by ASTM C231 shall be 4% ±1%.
- C. Maximum water-cement ratio for Class A concrete = 0.45 by weight.
- D. Use classes of concrete as described in the following table:

Class	Type of Work	28-Day Compressive Strength (in psi)	Minimum Cement Content (in lbs per C.Y.)
A	Concrete for all structures and concrete not otherwise specified. Concrete fill at structure foundations, cradle, supports across pipe trenches, and reinforced pipe encasement.	4,000	564
C	Floor grout and miscellaneous unreinforced concrete.	2,000	470

- E. Measure slump in accordance with ASTM C143. Slump shall be as follows:

Slab on grade or heavy sections wider (in plan view) than 3 feet	4 inches maximum
Footings, walls, suspended slabs, beams, and columns	4 inches maximum

Proportion and produce the concrete to have a maximum slump as shown. A tolerance of up to 1 inch above the indicated maximum shall be allowed for individual batches provided the average for all batches or the most recent 10 batches tested, whichever is fewer, does not exceed the maximum limit. Concrete of lower than usual slump may be used provided it is properly placed and consolidated.

- F. Aggregate size shall be 3/4 inch maximum for slabs and sections 8 inches thick and less. Aggregate size shall be 1 inch maximum for slabs and sections greater than 8 inches and less than 17 inches. Aggregate size shall be 1 1/2 inches maximum for all larger slabs and sections. Aggregate size for floor grout shall be maximum 3/8 inch.
- G. Combined aggregate grading shall be as shown in the following table:

	<b>Maximum Aggregate Size</b>			
	<b>1 1/2"</b>	<b>1"</b>	<b>3/4"</b>	<b>3/8"</b>
Aggregate Grade per ASTM C33	467	57	67	8

- H. Mix design for pumped concrete shall produce a plastic and workable mix. The percentage of sand in the mix shall be based on the void content of the coarse aggregate.

**2.24 SLURRY CEMENT BACKFILL**

- A. Slurry cement backfill shall consist of a fluid, workable mixture of aggregate, cement, and water.
- B. Aggregate shall be either:
  1. Material selected from excavation, imported material, or a combination thereof, free from organic matter and other deleterious materials and meeting the following gradation:

<b>Sieve Sieves</b>	<b>Percentage Passing</b>
1 1/2 inches	100
1 inch	80 to 100
3/4 inch	60 to 100
3/8 inch	50 to 100
No. 4	40 to 80
No. 100	10 to 40

- 2. Commercial quality concrete sand.



- C. Proportion the aggregate, cement, and water by either weight or volume. Include at least 188 pounds of cement per cubic yard produced. The water content shall be sufficient to produce a fluid, workable mix that will flow and can be pumped without segregation of the aggregate while being placed.
- D. Thoroughly machine-mix the materials for the slurry cement backfill in pugmill, rotary drum, or other mixer. Continue the mixing until the cement and water are thoroughly dispersed throughout the material. Place slurry cement backfill within one hour after mixing.

#### 2.25 CURING COMPOUND

- A. Curing compound shall conform to ASTM C309, Type 1, Class A.
- B. Curing compound shall be compatible with required finishes and coatings and shall meet the State of California Clean Air Quality Standards.

#### 2.26 MATS, PAPER, AND SHEETING FOR CURING

- A. Burlap mats shall conform to AASHTO M182.
- B. Sisal-kraft paper and polyethylene sheets shall conform to ASTM C171.

#### 2.27 REINFORCING DOWEL ADHESIVE

Dowel anchor adhesive shall be HIT-RE 500-SD by Hilti, Sikadur 31 Hi-Mod Gel by Sika, or equal.

### PART 3- EXECUTION

#### 3.01 FORM TOLERANCES

- A. Failure of the forms to produce the specified concrete surface and surface tolerance shall be grounds for rejection of the concrete work. Rejected work shall be repaired or replaced at no additional cost to the Owner.
- B. The following table indicates tolerances or allowable variations from dimensions or positions of structural concrete work:

	<b>Maximum Tolerance (inch)</b>
Sleeves and inserts	+1/4 -1/4
Projected ends of anchors	+1/4 -0.0
Anchor bolt setting	+1/4 -1/4
Finished concrete, all locations	+1/4 -1/4 in 10 feet
	Max ±1-inch in total length

The planes or axes from which the above tolerances are to be measured shall be as follows:

Sleeves and inserts:	Centerline of sleeve or insert.
Projected ends of anchors:	Plane perpendicular to the end of the anchor as located in the drawings.
Anchor bolt setting:	Centerline of anchor bolt.
Finish concrete:	The concrete surface as defined in the drawings.

Where equipment is to be installed, comply with the manufacturer's tolerances if more restrictive than above.

### 3.02 FORM SURFACE PREPARATION

- A. Clean form surfaces to be in contact with concrete of foreign material prior to installation.
- B. Coat form surfaces in contact with concrete with a release agent prior to form installation.

### 3.03 FORM REUSE

Reuse only forms that provide a uniform surface texture on exposed concrete surfaces. Apply light sanding or other surface treatment between uses for uniform texture. Plug unused tie rod holes with corks, shave flush, and sand the concrete surface side. Do not patch forms other than filling tie rod holes, except in the case of Class II forms. Do not use metal patching discs on Class I forms.

### 3.04 REMOVAL OF FORMS

- A. Forms and shoring for elevated structural slabs or beams shall remain in place until the concrete has reached a compressive strength equal to the specified 28-day compressive strength as determined by test cylinders. Do not remove supports and reshore. The following table indicates the minimum allowable time

after the last cast concrete is placed before forms, shoring, or wall bracing may be removed:

Sides of footings and encasements	24 hours
Walls, vertical sides of beams, girders, columns, and similar members not supporting loads	48 hours
Slabs, beams, and girders	10 days (forms only)
Shoring for slabs, beams, and girders	Until concrete strength reaches specified 28-day strength
Wall bracing	Until top or roof slab concrete reaches specified 28-day strength

- B. Do not remove forms from concrete that has been placed with outside air temperature below 50°F without first determining if the concrete has properly set without regard for time. Do not apply heavy loading on green concrete. Immediately after forms are removed, the surface of the concrete shall be carefully examined and any irregularities in the surface shall be repaired and finished as specified.

### 3.05 FORMED OPENINGS

Openings shall be of sufficient size to permit final alignment of pipes or other items without deflection or offsets of any kind. Allow space for packing where items pass through the wall to ensure watertightness. Provide openings with continuous keyways and water stops. Provide a slight flare to facilitate grouting and the escape of entrained air during grouting. Provide formed openings with reinforcement as indicated in the typical structural details. Reinforcing shall be at least 2 inches clear from the opening surfaces and encased items.

### 3.06 EMBEDDED ITEMS

Set anchor bolts and other embedded items accurately and hold securely in position until the concrete is placed and set. Check all special castings, channels, or other metal parts that are to be embedded in the concrete prior to and again after concreting. Check nailing blocks, plugs, and strips necessary for the attachment of trim, finish, and similar work prior to concreting.

### 3.07 BEVELED EDGES (CHAMFER)

Form 3/4-inch beveled edges on exposed concrete edges and corners, beam soffit corners, and where indicated in the drawings. Reentrant corners in concrete members shall not have fillets, unless otherwise shown in the drawings. The top edges of slabs, walkways, beams, and walls may be beveled with an edging trowel in lieu of using chamfer strips.

### 3.08 CONSTRUCTION JOINTS

A. Provide construction joints in accordance with the following:

1. Slabs: Maximum spacing of 40 feet on center in each direction in plan.

For purposes of maximum spacing requirements, expansion joints are considered to be construction joints.

The foregoing applies unless otherwise indicated in the drawings.

B. Place expansion joint fillers at right-angle turns, and wherever concrete walks butt into vertical surfaces.

C. For control joints of nonstructural slabs, provide partial depth plastic strips set flush with finished surface or 1/8-inch-wide joints cut with a diamond saw. Use control joints one-quarter to one-third the depth of the slab unless otherwise indicated.

D. Construction joints shall be keyed, unless otherwise detailed. Form keyways by beveled strips or boards placed at right angles to the direction of shear. Except where otherwise shown in the drawings or specified, keyways shall be at least 1 1/2 inches in depth over at least 25% of the area of the section.

E. When it is necessary to make a joint because of an emergency, furnish and place reinforcing dowels across the joint normal to the face of joint created if not normal to specified reinforcement and at the centerline of the concrete section being terminated. Carefully remove set concrete to a plane but rough surface near normal to adjacent formed or finish surfaces. Embed and extend dowels 48 bar diameters each side of the joint. Size and spacing of dowels shall match the largest reinforcing in the member but no closer than 6 inches on center. Furnishing and placing such reinforcing steel shall be at the Contractor's expense.

F. After a concrete placement pour has been completed to the construction joint and the concrete has hardened, thoroughly clean the entire surface of the joint of surface laitance, loose or defective concrete, and foreign material. Expose clean aggregate by sandblasting and thoroughly cleaning the surface of construction joints before placing the new concrete. Cover horizontal construction joints with grout bedding. Spread uniformly and work thoroughly into all irregularities of the surface. The consistency of the mortar shall be suitable for placing and working and shall be placed immediately prior to placing new concrete.

G. In case of emergency, place additional construction joints. (An interval of 45 minutes constitutes cause for an emergency construction joint.)

### 3.09 EXPANSION JOINTS

Provide expansion joints with continuous edge reservoirs, which shall be filled with a joint sealant. Leave the material used for forming the reservoirs in place until immediately before the grooves are cleaned and filled with joint sealant. After removing edge forms from the reservoir, remove grout, loose concrete, and fins; then sandblast the slots. Allow the reservoirs to become thoroughly dry; then blow out the reservoirs and immediately prime and fill with the expansion joint sealant and backup materials. The primer used shall be supplied by the same manufacturer supplying the joint sealant.

### 3.10 TIME BETWEEN POURS

At least two hours shall elapse after depositing concrete in the columns or walls before depositing in beams, girders, or slabs supported thereon. Place beams, girders, brackets, column capitals, and haunches monolithically as part of the floor or roof system, unless otherwise indicated in the drawings.

### 3.11 INSTALLATION OF PREMOLDED JOINT FILLER

Install in joint accurately as shown. Attach to concrete with a bonding agent recommended by the joint sealant and joint filler manufacturer for compatibility.

### 3.12 INSTALLATION OF JOINT SEALANTS

- A. Immediately before installing the joint sealant, clean the joint cavity by sandblasting or power wire brushing. Install bond breaker tape per manufacturer's instructions.
- B. After the joints have been prepared as described above, apply the joint sealant. Apply the primer, if required, and joint sealant only with the equipment and methods recommended by the joint sealant manufacturer. Application criteria for the sealant materials, such as temperature and moisture requirements and primer cure time, shall be in accordance with the recommendations of the sealant manufacturer.
- C. Apply masking tape along the edges of the exposed surface of the exposed joints. Trowel the joints smooth with a tuck pointing tool wiped with a solvent recommended by the sealant manufacturer.
- D. After the sealant has been applied, remove the masking tape and any sealant spillage.

### 3.13 INSTALLATION OF STEEL EXPANSION JOINT DOWELS

Install parallel to wall or slab face, perpendicular to the joint face, and in true horizontal position. Secure tightly in forms with rigid ties. Orient dowels to permit joint movement.

### 3.14 PLACING REINFORCEMENT

- A. Place reinforcing steel in accordance with the current edition of Recommended Practice for Placing Reinforcing Bars, published by the Concrete Reinforcing Steel Institute.
- B. Place reinforcing in accordance with the following, unless otherwise indicated:
  - 1. Reinforcement indicated in the drawings is continuous through the structure to the farthest extent possible. Terminate bars and hooks 2 inches clear from faces of concrete.
  - 2. Splices may be used to provide continuity due to bar length limitations. Minimum length of bars spliced for this reason is 30 feet. Splicing of reinforcement that is detailed to be continuous in the drawings is not permitted.
- C. Reinforcing steel, before being positioned and just prior to placing concrete, shall be free from loose mill and rust scale and from any coatings that may destroy or reduce the bond. Clean reinforcing steel by sandblasting or wire brushing and remove mortar, oil, or dirt to remove materials that may reduce the bond.
- D. Do not straighten or re-bend reinforcing steel in the field.
- E. Position reinforcing steel in accordance with the drawings and secure by using annealed wire ties or clips at intersections and support by concrete or metal supports, spacers, or metal hangers. Do not place metal clips or supports in contact with the forms. Bend tie wires away from the forms to provide the specified concrete coverage. Reinforcing bars, in addition to those shown in the drawings, which may be found necessary or desirable by the Contractor for the purpose of securing reinforcement in position shall be provided by the Contractor at his own expense.
- F. Place reinforcement a minimum of 2 inches clear of any metal pipe or fittings.
- G. Secure reinforcing dowels in place prior to placing concrete. Do not press dowels into the concrete after the concrete has been placed.
- H. Roll wire mesh used for reinforcement flat before placing concrete. Support and tie wire mesh to prevent movement during concrete placement.
- I. Position dowels for masonry walls to occur at reinforced block cells.

### 3.15 SITE-MIXED CONCRETE

Conform to ACI 304.

### 3.16 READY-MIXED CONCRETE

Conform to ASTM C94.

### 3.17 PLACING CONCRETE

Conform to ACI 304.

### 3.18 PUMPING CONCRETE

Conform to ACI 304.2R-96.

### 3.19 WEATHER REQUIREMENTS

- A. Conform to ACI 305 for placing during hot weather.
- B. Conform to ACI 306 for placing during cold weather.

### 3.20 BACKFILL AGAINST WALLS

- A. Do not place backfill against walls until the concrete has obtained a compressive strength equal to the specified 28-day compressive strength. Where backfill is to be placed on both sides of the wall, place the backfill uniformly on both sides.
- B. Do not backfill the walls of structures that are laterally restrained or supported by suspended slabs or slabs on grade until the slab is poured and the concrete has reached the specified compressive strength.

### 3.21 PLACING SLURRY CEMENT BACKFILL

Place slurry cement backfill in a uniform manner that will prevent voids in, or segregation of, the backfill. Remove foreign material that falls into the excavation or trench. Do not commence backfilling over or place any material over the slurry cement backfill until at least four hours after placing the slurry cement backfill, except that when concrete sand is used for the aggregate and the in-place material is free draining, backfilling may commence as soon as the surface water is gone.

### 3.22 CONCRETE FINISHES

- A. Complete concrete surfaces in accordance with the following schedule:

<b>Finish Designation</b>	<b>Area Applied</b>
F-1	Beams, columns, and exterior walls not exposed to view.
F-3	Beams, columns, and walls of structures or buildings exposed to view. Underside of formed floors or slabs.
F-4	Exterior and interior surfaces to be coated.
S-1	Slabs and floors to be covered with concrete or grout.
S-4	Slabs and floors of structures or buildings exposed to view.
S-5	Slabs and floors at slopes greater than 10% and stairs.
E-1	Exposed edges. EXCEPTION: edges normally covered with earth.
E-2	Top of walls, beams, and similar unformed surfaces.

- B. Finish F-1: Repair defective concrete, fill depressions deeper than 1/2 inch, and fill tie holes.

Finish F-3: In addition to Finish F-1, remove fins, fill depressions 1/4 inch or deeper, fill depressions and airholes with mortar. Dampen surfaces and then spread a slurry consisting of one part cement and one and one-half parts sand by damp loose volume, over the surface with clean burlap pads or sponge rubber floats. Remove any surplus by scraping and then rubbing with clean burlap.

Finish F-4: Repair defective concrete, remove fins, fill depressions 1/16 inch or deeper, fill tie holes, remove mortar spatter, and remove bulges higher than 1/16 inch.

Finish S-1: Screed to grade without special finish.

Finish S-4: Steel trowel finish without local depressions or high points and apply a light hair-broom finish. Do not use stiff bristle brooms or brushes. Leave hair-broom lines parallel to the direction of slab drainage.

Finish S-5: Steel trowel finish without local depressions or high points. Apply a stiff bristle broom finish. Leave broom lines parallel to the direction of slope drainage.

Finish E-1: Provide chamfer or beveled edges.

Finish E-2: Strike smooth and float to an F-3 or F-4 finish.



### 3.23 CURING CONCRETE

- A. Conform to ACI 308.
- B. Water cure with burlap mats unless optional curing methods are permitted.
- C. It is the responsibility of the Contractor to select the appropriate curing method in response to climatical and/or site conditions occurring at the time of concrete placement. Take appropriate measures as described in ACI 305 and 306 for protecting and curing concrete during hot and cold weather.

### 3.24 REPAIR OF DEFECTS AND CRACKS

- A. Do not repair defects until concrete has been evaluated by the Owner's Representative.
- B. Surface Defects:
  - 1. Repair surface defects that are smaller than 1 foot across in any direction and are less than 1/2 inch in depth.
  - 2. Repair by removing the honeycombed and other defective concrete down to sound concrete, cut or grind edges perpendicular to the surface and at least 3/8 inch deep, abrasive clean and thoroughly dampen the surface, work into the surface an epoxy bonding agent, and fill the hole with one part cement to one part fine sand. Match the finish on the adjacent concrete, and cure as specified.
- C. Severe Defects:
  - 1. Repair severe defects that are larger than surface defects but do not appear to affect the structural integrity of the structure.
  - 2. Repair by removing the honeycombed and other defective concrete down to sound concrete, make edges of the repair area perpendicular to the surface, as required above, sandblast the sound concrete surface, coat the exposed surfaces with epoxy bonding compound, place nonshrink grout, match the finish on the adjacent concrete, and cure as specified.
- D. Repair minor cracks in concrete structures that are wider than 1/10 inch by cutting out a square edged and uniformly aligned joint 3/8 inch wide by 3/4 inch deep, preparing exposed surfaces of the joint, priming the joint, and applying polyurethane joint sealant.
- E. If the cracks are major or affect the hydraulic capacity or function of the element, the Owner's Representative may require the concrete to be repaired by epoxy injection.

- F. Major Defects and Cracks: If the defects affect the structural integrity of the structure or if patching does not satisfactorily restore quality and appearance to the surface, the Owner's Representative may require the concrete to be removed and replaced, complete.
- G. If manufacturer's recommendations differ from the methods described in this section, follow the manufacturer's recommendations.

### 3.25 ALUMINUM SURFACES IN CONTACT WITH CONCRETE

Coat aluminum surfaces in contact with concrete per Section 099000, System No. 54.

### 3.26 CONCRETE TESTS

- A. Concrete quality testing will be performed on the concrete by the Owner as follows:
  - 1. Frequency of Sampling: Cast four concrete test cylinders from each 50 cubic yards, or fraction thereof, of each class of concrete placed in any one day. Sampling and curing of cylinders shall conform to ASTM C31.
  - 2. Strength Testing: Test cylinders in accordance with ASTM C39. Test one cylinder at 7 days for information; test two cylinders at 28 days for acceptance; and hold one cylinder for verification. Strength acceptance will be based on the average of the strengths of the two cylinders tested at 28 days. If one cylinder of a 28-day test manifests evidence of improper sampling, molding, or testing, other than low strength, discard it and use the fourth cylinder for the test result.
  - 3. Determine concrete slump by ASTM C143 with each strength test sampling and as required to establish consistency.
  - 4. Determine air content of the concrete using ASTM C231 to verify the percentage of air in the concrete immediately prior to depositing in forms.
  - 5. Concrete acceptance shall be based on the requirements of ACI 318.
- B. To facilitate concrete sampling and testing, the Contractor shall:
  - 1. Furnish labor to assist the Owner in obtaining and handling samples at the project site.
  - 2. Advise the Owner in advance of concrete placing operations to allow for scheduling and completion of quality testing.
  - 3. Provide and maintain facilities for safe storage and proper curing of concrete test specimens on the project site, as required by ASTM C31.

END OF SECTION

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## SECTION 034220 PRECAST CONCRETE VAULTS

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, design, and installation of precast concrete vaults and structures.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. General Concrete Construction: 030500
- B. Access Hatches: 055300.
- C. Earthwork: 312300.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit manufacturer's catalog data on precast concrete items. Show dimensions of vaults and thicknesses of walls, floors, and top slabs. Show reinforcing wire and steel. Show materials of construction by ASTM reference and grade.
- C. Submit manufacturer's design calculations and certification signed and sealed by a professional civil or structural engineer registered in the State of California that vault design and construction comply with the specified design load conditions and the referenced ASTM specifications (e.g., ASTM C857 and C858).

### PART 2- MATERIALS

#### 2.01 MANUFACTURERS

Precast concrete vaults shall be manufactured by Mid-State Concrete Products, or equal.

#### 2.02 PRECAST CONCRETE VAULTS

- A. Precast concrete vaults shall comply with ASTM C858 except as modified herein.

- B. Design loads shall be in accordance with ASTM C857, except as modified herein. Traffic loads, unless otherwise stated, shall conform to Load Designation A-16 per Table 1. Soil lateral loads shall be as determined by ASTM C857 or loadings specified in the project soils report, whichever is greater. Alternate design by the strength design method shall include a load factor of 1.7 times the lateral earth or hydrostatic pressures.
- C. Include the following load conditions in the design:
  - 1. Vault roof removed while structure is backfilled to grade and subject to live and dead loads.
  - 2. Vault roof in place and walls subject to simultaneous vertical and horizontal application of all live, impact, and dead loads. Include the case of an A-16 designated load placed directly above the wall.
- D. Design shall also comply with the following restrictions:
  - 1. The maximum reinforcement ratio allowed is one-half the reinforcement ratio that would produce a balanced strain condition.
  - 2. Earth pressure shall be converted to a horizontal pressure using a coefficient of earth pressure at rest of 0.5 and not a coefficient of active earth pressure.
  - 3. Include a live load surcharge of 2 feet of soil in the design of the walls.
  - 4. Minimum protective cover over reinforcement shall be 1 inch.
  - 5. Minimum concrete compressive strength shall be 4,000 psi.
- E. Design all vaults to receive the specified traffic loading.
- F. Precast vault construction shall be in the form of monolithic walls or horizontal wall sections; do not use panel walls.
- G. Minimum wall thickness shall be 6 inches. Design knockout wall panels to accommodate loading pressures defined above.
- H. Floor slab shall be precast concrete. Calculations for the floor slab design shall be included in the vault design submittal.
- I. Design joints using a butyl rubber sealant per ASTM C990.

## 2.03 SEALANTS AND MORTAR

Butyl rubber sealing compound shall comply with ASTM C990. Mortar shall comply with ASTM C387, Type S or use grout complying with Section 030500.

## 2.04 ACCESS HATCHES

- A. Provide traffic-rated access hatches per Section 055300.

## 2.05 INSERTS

Handling eyes, lifting inserts, and threaded inserts shall be Type 304 stainless steel.

## 2.06 CEMENT

Cement shall be ASTM C150, Type II/V.

## 2.07 CRUSHED ROCK BASE

Crushed rock base material shall comply with Section 312300.

## PART 3- EXECUTION

### 3.01 VAULT BASE

- A. Excavate for the vault and install a crushed rock base per Section 312300, 12 inches thick.
- B. Crushed rock base material shall extend 12 inches beyond the outside edge of the concrete vault base. Compact gravel using vibrating plate.

### 3.02 SEALING AND GROUTING

Fill joints between precast sections with either a butyl rubber sealing compound or mortar.

### 3.03 INSTALLING VAULTS

- A. After the excavation has been completed, level the area where the base section is to be installed. Fill and compact the base material and provide a level and solid foundation. Set the base such that water will drain toward the sumps.
- B. Assemble the vault sections by lowering onto the preceding base or section. Set level and firmly position the base or preceding section before placing additional sections.
- C. Set each precast concrete vault section plumb on a bed of sealant or cement mortar at least 1/2 inch thick to make a watertight joint with the concrete base and with the preceding unit. Remove foreign materials such as dirt, mud, and stones from joint surfaces. Apply grout or sealant such that no voids occur. Point the inside joint and wipe off the excess mortar or sealant.

- D. If a misalignment of sections occurs during the installation, remove and reinstall the section. Do not reinstall damaged sections. If the sealing material is damaged, clean the joint surfaces before repairing or placing new sealing material.
- E. Install the concrete roof such that it slopes at least 1/8 inch per foot toward the drainage channel around the roof hatch.

#### 3.04 BACKFILL AROUND VAULTS

Backfill and compact around the vaults using fill as specified in Section 312300. Compact to 95% relative compaction.

END OF SECTION



## SECTION 034230 PRECAST CIRCULAR CONCRETE WET WELLS

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes design, materials, testing, and installation of precast circular concrete wet wells.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. General Concrete Construction: 030500.
- B. Access Hatches: 055300.
- C. Chemical-Resistant Coatings for Concrete: 099720
- D. Earthwork: 312300.
- E. Trenching, Backfilling, and Compacting: 312316.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit manufacturer's catalog data for precast concrete wet wells, frames, and covers. Show dimensions and materials of construction by ASTM reference and grade. Show lettering on manhole covers.

### PART 2- MATERIALS

#### 2.01 PRECAST CIRCULAR CONCRETE WET WELLS

- A. Precast circular concrete wet wells shall comply with ASTM C76. Design wet wells for the depths shown in the drawings, assuming a soil density of 130 pounds per cubic foot. Design wet well to resist flotation under the conditions of empty wet well and groundwater level from the wet well base to finish grade.
- B. Minimum wall thickness and minimum allowable steel shall be in accordance with ASTM C76, Class III, Wall "A" with double circular cage reinforcing.
- C. Precast top sections shall be flat slab. Provide an opening in the top section, sized and oriented as shown in the drawings.

D. Provide precast, reinforced base with a rubber gasket connection to the lower wet well section.

E. Manufacturers: Mid-State Concrete, or equal.

## 2.02 DESIGN OF TOP SECTION AND PRECAST BASE

Design loads shall be in accordance with ASTM C857, except as modified herein. Traffic loads, unless otherwise stated, shall conform to Load Designation A-16 per Table 1.

## 2.03 WET WELL FRAMES AND ACCESS HATCHES

A. Wet well frames and access hatches shall be as per Specification Section 055300. The access hatch shall seat firmly into the frame without rocking. Cast the frame into the top slab.

B. Finish each access hatch so that it will fit in its frame without rocking. Frames and access hatches shall be matchmarked in sets before shipping to the site.

## 2.04 WET WELL SECTION OR RISER JOINTS

Joints shall be of the rubber-gasket type, requiring no field-applied sealant. Gaskets and joints shall comply with ASTM C443.

## 2.05 PIPE CONNECTIONS FOR INLET PIPING

Provide resilient watertight connectors between the wet well and inlet piping in accordance with ASTM C923. Connections shall consist of a chemically resistant neoprene EPDM flexible boot, locking ring, and pipe clamp(s). The locking ring shall be stainless steel and shall lock the boot into the preformed opening in the manhole. The pipe clamp shall be stainless steel. Alternatively, cast the flexible boot in the wet well and eliminate the locking ring. Pipe connections shall be Kor-N-Seal by Dukor Corporation, Z-Lok-XP by A-Lok Products, Inc., or equal.

## 2.06 CRUSHED ROCK FOR WET WELL BASE

Crushed rock shall comply with Section 312300.

## 2.07 CONCRETE

Concrete for wet wells and precast bases shall be Type II/V per ASTM C150 and C595.

## PART 3- EXECUTION

### 3.01 WET WELL BASE

Excavate for the wet well and install a crushed rock base per Section 312300.

### 3.02 INSTALLING WET WELLS

- A. Set each precast concrete wet well sectional unit plumb to make a watertight joint with the precast concrete base or with the preceding sectional unit. Backfill, compact, and replace pavement.
- B. Assemble sectional units so that the top slab conforms to the elevation indicated on the plans. Where no elevation is shown the elevation shall be determined by the wet well location as follows:
  - 1. In Paved Areas: Top of slab shall be flush with the paving surface.
  - 2. In Shoulder Areas: Top of slab shall be flush with existing surface where it is in traveled way of shoulder and 1 inch above existing surface where it is outside limits of traveled way but not in unpaved open areas.
  - 3. In Unpaved Open Areas: Top of slab shall be 18 inches above the ground surface.

### 3.03 LEAKAGE TESTING

Perform testing before backfilling the wet well. Plug the pipes connected to the wet well. Fill the wet well with water to a point 1 foot below the top slab soffit or a maximum water depth of 30 feet. Allow the wet well to absorb water for four hours, then refill to the original water level. Allowable leakage shall be zero. Moisture or beads of water appearing on the surface of the joint will not be considered leakage. Duration of leakage test shall be four hours. If the allowable leakage rate is exceeded, repair or replace the wet well and retest.

### 3.04 BACKFILL AROUND WET WELLS

Backfill and compact around the wet wells per Section 312300.

### 3.05 COATING INTERIOR OF WET WELLS

Coat interior of wet wells per Section 099720. Coat finish floor of wet well, interior of rings, and interior of top slab. Reapply coating over all joints and penetration seals after rings are set and piping is installed to ensure a completely coated interior surface. Do not coat any metal.

END OF SECTION

## SECTION 055300 ACCESS HATCHES

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section describes materials, fabrication, and installation of aluminum access hatches.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. General Concrete Construction: 030500
- B. Precast Concrete Vaults: 034220.
- C. Precast Circular Concrete Wet Wells: 034230.
- D. Painting and Coating: 099000.

#### 1.03 DESIGN CRITERIA

- A. Access Hatches: 300 psf loading

#### 1.04 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit drawings of access hatches. Show dimensions and reference materials of construction by ASTM designation and grade. Show design criteria.

### PART 2- MATERIALS

#### 2.01 ALUMINUM ACCESS HATCHES

- A. Access hatches shall be aluminum, channel frame by Halliday, Bilco, or equal of the size and configuration shown in the drawings. Aluminum doors shall be anodized. Latch and lifting mechanism assemblies, hold-open arms and guides, and brackets, hinges, pins, and fasteners shall be Type 316 stainless steel.
- B. Locking and Latching Devices:
  - 1. Type 316 stainless steel slam lock with key and threaded plug.

## 2.02 PROTECTIVE GRATE FOR WET WELL ACCESS HATCHES

Provide hinged grating panel to cover each access hatch opening for the wet well. The grating panel shall fit beneath the access hatch cover. Provide Type 316 stainless steel hold-open arm with aluminum latch, Type 316 stainless steel hardware including mounting hardware and supports and aluminum grating with OSHA Safety Orange fusion-bonded coating. Provide spring-loaded lifting handle. Products: Halliday Products "Retro-Grate", or equal.

## PART 3- EXECUTION

### 3.01 STORAGE OF MATERIALS

Store structural 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.

### 3.02 INSTALLATION AND ERECTION

- A. Clean the surfaces of metalwork to be in contact with concrete of rust, dirt, grease, and other foreign substances before placing concrete.
- B. Set grating seats and frames and checkered plate frames and supports accurately in position when concrete is placed and support it rigidly to prevent displacement or undue vibration during or after the placement of concrete. Unless otherwise specified, where metalwork is to be installed in recesses in formed concrete, said recesses shall be made, metalwork installed, and recesses filled with dry-pack mortar in conformance with Section 030500.

### 3.03 GALVANIZING

Zinc coating for plates, bolts, anchor bolts, and threaded parts shall be in accordance with ASTM A153 and F2329.

### 3.04 REPAIR OF GALVANIZED SURFACES

Repair or replace metal with damaged galvanized surfaces at no additional cost to the Owner.

### 3.05 CORROSION PROTECTION OF ALUMINUM SURFACES

- A. Coat aluminum surfaces to be embedded or which will be in contact with concrete or masonry per Section 099000, System No. 54 before installation. Allow the coating to dry before the aluminum is placed in contact with the concrete.

- B. Where aluminum surfaces come in contact with dissimilar metals, keep the dissimilar metallic surfaces from direct contact by use of neoprene gaskets or washers.

END OF SECTION

## SECTION 099000 PAINTING AND COATING

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials and application of painting and coating systems for the following surfaces:

- A. Submerged metal.
- B. Exposed metal.
- C. Buried metal.
- D. Metal in contact with concrete.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. General Concrete Construction: 030500.
- B. Chemical-Resistant Coatings for Concrete: 099720.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit manufacturer's data sheets showing the following information:
  - 1. Percent solids by volume.
  - 2. Minimum and maximum recommended dry-film thickness per coat for prime, intermediate, and finish coats.
  - 3. Recommended surface preparation.
  - 4. Recommended thinners.
  - 5. Statement verifying that the specified prime coat is recommended by the manufacturer for use with the specified intermediate and finish coats.
  - 6. Application instructions including recommended equipment and temperature limitations.
  - 7. Curing requirements and instructions.

- C. Submit color swatches.
- D. Submit certificate and supplier's data sheets identifying the type and gradation of abrasives used for surface preparation. The certificate or data sheets shall specifically identify that the abrasives comply with federal and state of California regulations for materials to be used for abrasive blasting for surface preparation for paints and coatings.
- E. Submit material safety data sheets for each coating.

**PART 2- MATERIALS**

**2.01 PAINTING AND COATING SYSTEMS**

The following index lists the various painting and coating systems by service and generic type:

**PAINT COATINGS SYSTEM INDEX**

<b>No.</b>	<b>Title</b>	<b>Generic Coating</b>
<b>Submerged Metal Coating Systems</b>		
1.	Submerged Metal, Raw Sewage	Epoxy
6A.	Submerged Metal, Raw Sewage	Ceramic Epoxy
<b>Exposed Metal Coating Systems</b>		
10.	Exposed Metal, Corrosive Environment	High-build epoxy (two-coat system) with polyurethane topcoat
<b>Buried Metal Coating Systems</b>		
21.	Buried Metal	Epoxy
<b>Coating Systems for Nonferrous Metals</b>		
54.	Aluminum Insulation from Concrete and Carbon Steel	Epoxy
<b>Coating System for Color-Coding Fusion Epoxy-Coated Surfaces</b>		
66.	Fusion Epoxy-Coated Surfaces, Color Coding	Epoxy

These systems are specified in detail in the following paragraphs. For each coating, the required surface preparation, prime coat, intermediate coat (if required), topcoat, and coating thicknesses are described. Mil thicknesses shown are minimum dry-film thicknesses.



## 2.02 SUBMERGED METAL COATING SYSTEMS

### A. System No. 1--Submerged Metal, Raw Sewage:

Type: Epoxy having a minimum volume solids of 80%.

Service Conditions: For use in lining and coating pump discharge elbows in raw sewage wet wells. Minimum temperature resistance of the coating shall be 140°F for moist heat conditions.

Surface Preparation: SSPC SP-10.

Prime Coat: Tnemec Series N69 Hi-Build Epoxoline II, 5 to 10 mils; or equal.

Finish Coat: Tnemec Series 104 H.S. Epoxy, 4 to 10 mils; or equal.

### B. System No. 6A--Submerged Metal, Raw Sewage:

Type: Ceramic Epoxy:

Service Conditions: For use with lining and coating ductile iron pipe in raw sewage service and/or exposed to a moist saturated hydrogen sulfide atmosphere, as in raw sewage wet wells. Minimum temperature resistance of the coating shall be 140°F for moist heat conditions.

Interior Pipe Lining:

Tnemec Series 431 Perma-Shield PL polyamine ceramic epoxy, 40 mils, or equal.

Exterior Pipe Coating:

Prime Coat: Tnemec Series 140 Pota-Pox Plus epoxy primer, 3 to 5 mils, no equal.

Finish Coat: Tnemec Series 431 Perma-Shield PL polyamine ceramic epoxy, 30 to 40 mils, no equal.

#### SURFACE PREPARATION:

All ductile iron pipe and fittings shall be delivered to the application facility without asphalt, cement lining, or any other lining on the interior or exterior surface. All oils, small deposits of asphalt paint, grease, and soluble deposits shall be removed in accordance with NAPF 500-03-01 Solvent Cleaning prior to abrasive blasting.

Ductile Iron Pipe Interior Preparation: Uniformly rotary-abrasive blast the entire interior surface using angular abrasive to an NAPF 500-03-04: "Internal Pipe Surface Condition with full removal of annealing oxide layer". When viewed

without magnification, the interior surfaces shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. Any area where rust reappears before application shall be re-blasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns) (Reference NACE SP0287 or ASTM D4417, Method C)

Ductile Iron Pipe Exterior Preparation: Uniformly abrasive blast the entire exterior surface using angular abrasive to an NAPF 500-03-04: "External Pipe surface Condition". When viewed without magnification, the exterior surfaces shall be free of all visible dirt, dust, loose annealing oxide, loose mold coating, rust, and other foreign matter. Tightly adherent annealing oxide, mold coating and rust staining may remain on the surface provided they cannot be removed by lifting with a dull putty knife. Any area where rust reappears before application shall be re-blasted. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns) (Reference NACE SP0287 or ASTM D4417, Method C).

Ductile Iron Fittings: Uniformly abrasive blast the interior and exterior surfaces to an NAPF 500-03-05: "Fittings Blast Clean #1 Condition, No Staining". When viewed without magnification, the interior surfaces of cast iron fittings shall be free of all visible dirt, dust, annealing oxide, rust, mold coating, and other foreign matter. The surface shall contain a minimum angular anchor profile of 3.0 mils (76.2 microns).

Surface shall be coated within a maximum of eight hours of surface preparation.

Alternatively, furnish ductile iron pipe with the following lining and coating system:

Internal Pipe Coating: Induron Protecto 401, 40 mils, no equal. Factory applied only.

External Pipe Coating: Induron Ceramawrap, 20 to 25 mils, no equal. Factory or shop applied only.

## 2.03 EXPOSED METAL COATING SYSTEMS

### A. System No. 10--Exposed Metal, Corrosive Environment:

Type: High-build epoxy finish coat having a minimum volume solids of 60%, with an inorganic zinc prime coat.

Service Conditions: For use with metal structures or pipes subjected to water condensation; chemical fumes, such as hydrogen sulfide; salt spray; and chemical contact.

Surface Preparation: SSPC SP-10.

Prime Coat: Self-curing, two-component inorganic zinc-rich coating recommended by the manufacturer for overcoating with a high-build epoxy finish coat. Minimum zinc content shall be 12 pounds per gallon. Apply to a thickness of 2.5 to 3.5 mils DFT. Products: Tnemec 904 H2O Hydro Zinc, Devoe Catha-Coat 304 or 304V, International Interzinc 22HS, PPG Dimetcote 9HS, Sherwin-Williams Zinc-Clad II Plus, PPG METALHIDE® 28 Inorganic Zinc-Rich Primer 97-672, or equal.

Finish Coat: Tnemec V69 Epoxoline, Devoe Devran 224HS or 231, International Interseal 670HS, PPG Amercoat 385, Carboline Carboguard 890, Sherwin-Williams Macropoxy 646 B58-600, PPG PITT-GUARD® Direct-to-Rust Epoxy Mastic Coating 97-145 series, or equal; 5.0 to 8.0 mils DFT.

## 2.04 BURIED METAL COATING SYSTEMS

### A. System No. 21--Buried Metal:

Type: High solids epoxy or phenolic epoxy having a minimum volume solids of 80% (ASTM D2697).

Service Conditions: Buried metal, such as valves, flanges, bolts, nuts, structural steel, and fittings.

Surface Preparation: SSPC SP-10.

Coating System: Apply three or more coats of PPG Amerlock 400 or 400VOC, Tnemec 104HS or 80, Devoe Bar-Rust 233H, Carboline 890LT, Sherwin-Williams Tank Clad HS B62-80 series, or equal; 30 mils total. Maximum thickness of an individual coating shall not exceed the manufacturer's recommendation.

Surface Preparation: SSPC SP-10.

Prime Coat: Not required.

Finish Coat: Apply two coats of Carboline Bitumastic 50, 15 mils each; two or more coats of Tnemec 46-465, to a total thickness of 30 mils; or equal.

## 2.05 COATING SYSTEMS FOR NONFERROUS METALS

### A. System No. 54--Aluminum Insulation from Concrete and Carbon Steel:

Type: High solids epoxy or phenolic epoxy having a minimum volume solids of 80% (ASTM D2697).

Service Conditions: Coat areas of aluminum grating, stairs, structural members or aluminum fabrications, in contact with concrete or carbon steel with this system.

Surface Preparation: Solvent or steam cleaning per SSPC SP-1; do not use alkali cleaning. Then dust blast.

Coating System: Apply three or more coats of PPG Amerlock 400 or 400VOC, Tnemec Series 135, Devoe Bar-Rust 233H, Sherwin-Williams Macropoxy B58-600, PPG PITT-GUARD® Direct-to-Rust Epoxy Mastic Coating 97-145 series, or equal; 30 mils total. Maximum thickness of an individual coating shall not exceed the manufacturer's recommendation.

## 2.06 COATING SYSTEMS FOR FUSION EPOXY-COATED SURFACES

### A. System No. 66--Fusion Epoxy-Coated Surfaces, Color Coding:

Type: Epoxy having a minimum volume solids content of 60%.

Application: Color coding of pipe or surfaces previously coated with fusion bonded epoxy.

Surface Preparation: SSPC SP-1. After SP-1, sweep blast the epoxy surface per SP-7 to provide a 2 to 3 mil profile in the fusion bonded epoxy substrate.

Prime Coat: None.

Finish Coat: Once coat of Carboline Carboguard 890 LT, Tnemec Series 104, Sherwin Williams Macropoxy 646 B58-600 series, or equal. Apply to a minimum dry film thickness of 5 mils.

## 2.07 ABRASIVES FOR SURFACE PREPARATION

### A. Abrasives used for preparation of ferrous (excluding stainless steel) surfaces shall be one of the following:

1. 16 to 30 or 16 to 40 mesh silica-free sand or mineral grit.
2. 20 to 40 mesh garnet.
3. Crushed iron slag, 100% retained on No. 80 mesh.
4. SAE Grade G-40 or G-50 iron or steel grit.

### B. In the above gradations, 100% of the material shall pass through the first stated sieve size and 100% shall be retained on the second stated sieve size.

### C. Abrasives shall meet all requirements of the California Air Resources Control Board for content and emissions.

## PART 3- EXECUTION

### 3.01 WEATHER CONDITIONS

- A. Do not paint in the rain, wind, snow, mist, and fog or when steel or metal surface temperatures are less than 5°F above the dew point.
- B. Do not apply paint when the relative humidity is above 85%.
- C. Do not paint when temperature of metal to be painted is above 120°F.
- D. Do not apply inorganic zinc paint if air or surface temperature is below the manufacturer's recommendations or expected to drop below the manufacturer's recommendations within 24 hours.
- E. Do not apply epoxy, acrylic latex, and polyurethane paints on an exterior or interior surface if air or surface temperature is below the manufacturer's recommendations or expected to drop below the manufacturer's recommendations within 24 hours.

### 3.02 SURFACE PREPARATION PROCEDURES

- A. Application of coatings over asphaltic coating is not allowed.
- B. Remove oil and grease from metal surfaces in accordance with SSPC SP-1. Use clean cloths and cleaning solvents and wipe dry with clean cloths. Do not leave a film or greasy residue on the cleaned surfaces before abrasive blasting.
- C. Remove weld spatter and weld slag from metal surfaces and grind smooth rough welds, beads, peaked corners, and sharp edges including erection lugs in accordance with SSPC SP-2 and SSPC SP-3. Grind 0.020 inch (minimum) off the weld caps on pipe weld seams. Grind outside sharp corners, such as the outside edges of flanges, to a minimum radius of 1/4 inch.
- D. Do not abrasive blast or prepare more surface area in one day than can be coated in one day; prepare surfaces and apply coatings the same day. Remove sharp edges, burrs, and weld spatter.
- E. For carbon steel, do not touch the surface between the time of abrasive blasting and the time the coating is applied. Apply coatings within two hours of blasting or before any rust bloom forms.
- F. Surface preparation shall conform with the SSPC specifications as follows:

Solvent Cleaning	SP-1
Hand Tool Cleaning	SP-2
Power Tool Cleaning	SP-3
White Metal Blast Cleaning	SP-5
Commercial Blast Cleaning	SP-6
Brush-Off Blast Cleaning	SP-7
Pickling	SP-8
Near-White Blast Cleaning	SP-10
Power Tool Cleaning to Bare Metal	SP-11
Surface Preparation and Cleaning of Steel and Other Hard Materials by High- and Ultrahigh-Pressure Water Jetting Prior to Recoating	SP-12
Surface Preparation of Concrete	SP-13

- G. Wherever the words “solvent cleaning,” “hand tool cleaning,” “wire brushing,” or “blast cleaning” or similar words are used in these specifications or in paint manufacturer’s specifications, they shall be understood to refer to the applicable SSPC (Society for Protective Coatings), surface preparation specifications listed above.
- H. For carbon steel surfaces, after abrasive blast cleaning, the height of the surface profile shall be 2 to 3 mils. Verify the surface profile by measuring with an impresser tape acceptable to the Owner’s Representative. Perform a minimum of one test per 100 square feet of surface area. Testing shall be witnessed by the Owner’s Representative. The impresser tape used in the test shall be permanently marked with the date, time, and locations where the test was made. Test results shall be promptly presented to the Owner’s Representative.
- I. Do not apply any part of a coating system before the Owner’s Representative has reviewed the surface preparation. If coating has been applied without this review, and if directed by the Owner’s Representative, remove the applied coating by abrasive blasting and reapply the coat in accordance with this specification.

**3.03 ABRASIVE BLAST CLEANING**

- A. Use dry abrasive blast cleaning for metal surfaces. Do not use abrasives in automatic equipment that have become contaminated. When shop or field blast cleaning with handheld nozzles, do not recycle or reuse blast particles.
- B. After abrasive blast cleaning and prior to application of coating, dry clean surfaces to be coated by dusting, sweeping, and vacuuming to remove residue from blasting. Apply the specified primer or touch-up coating within the period of an eight-hour working day. Do not apply coating over damp or moist surfaces.

Reclean prior to application of primer or touch-up coating any blast cleaned surface not coated within said eight-hour period.

- C. Keep the area of the work in a clean condition and do not permit blasting particles to accumulate and constitute a nuisance or hazard.
- D. During abrasive blast cleaning, prevent damage to adjacent coatings. Schedule blast cleaning and coating such that dust, dirt, blast particles, old coatings, rust, mill scale, etc., will not damage or fall upon wet or newly coated surfaces.

#### 3.04 PROCEDURES FOR ITEMS HAVING SHOP-APPLIED PRIME COATS

- A. After application of primer to surfaces, allow coating to cure for a minimum of two hours before handling to minimize damage.
- B. When loading for shipment to the project site, use spacers and other protective devices to separate items to prevent damaging the shop-primed surfaces during transit and unloading. If wood spacers are used, remove wood splinters and particles from the shop-primed surfaces after separation. Use padded chains or ribbon binders to secure the loaded items and minimize damage to the shop-primed surfaces.
- C. Cover shop-primed items 100% with protective coverings or tarpaulins to prevent deposition of road salts, fuel residue, and other contaminants in transit.
- D. Handle shop-primed items with care during unloading, installation, and erection operations to minimize damage. Do not place or store shop-primed items on the ground or on top of other work unless ground or work is covered with a protective covering or tarpaulin. Place shop-primed items above the ground upon platforms, skids, or other supports.

#### 3.05 FIELD TOUCH-UP OF SHOP-APPLIED PRIME COATS

- A. Remove oil and grease surface contaminants on metal surfaces in accordance with SSPC SP-1. Use clean rags wetted with a degreasing solution, rinse with clean water, and wipe dry.
- B. Remove dust, dirt, salts, moisture, chalking primers, or other surface contaminants that will affect the adhesion or durability of the coating system. Use a high-pressure water blaster or scrub surfaces with a broom or brush wetted with a solution of trisodium phosphate, detergent, and water. Rinse scrubbed surfaces with clean water.
- C. Remove loose or peeling primer and other surface contaminants not easily removed by the previous cleaning methods in accordance with SSPC SP-7. Take care that remaining primers are not damaged by the blast cleaning operation. Remaining primers shall be firmly bonded to the steel surfaces with blast cleaned edges feathered.

- D. Remove rust, scaling, or primer damaged by welding or during shipment, storage, and erection in accordance with SSPC SP-10. Take care that remaining primers are not damaged by the blast cleaning operation. Areas smaller than 1 square inch may be prepared per SSPC SP-11. Remaining primers shall be firmly bonded to the steel surfaces with cleaned edges feathered.
- E. Use repair procedures on damaged primer that protects adjacent primer. Blast cleaning may require the use of lower air pressure, smaller nozzles, and abrasive particle sizes, short blast nozzle distance from surface, shielding, and/or masking.
- F. After abrasive blast cleaning of damaged and defective areas, remove dust, blast particles, and other debris by dusting, sweeping, and vacuuming; then apply the specified touch-up coating.
- G. Surfaces that are shop primed shall receive a field touch-up of the same primer used in the original prime coat.

### 3.06 PAINTING SYSTEMS

- A. All materials of a specified painting system, including primer, intermediate, and finish coats, shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer for the particular coating system.
- B. Deliver paints to the jobsite in the original, unopened containers.

### 3.07 PAINT STORAGE AND MIXING

- A. Store and mix materials only in areas designated for that purpose by the Owner's Representative. The area shall be well-ventilated, with precautionary measures taken to prevent fire hazards. Post "No Smoking" signs. Storage and mixing areas shall be clean and free of rags, waste, and scrapings. Tightly close containers after each use. Store paint at an ambient temperature from 50°F to 100°F.
- B. Prepare multiple-component coatings using all of the contents of the container for each component as packaged by the paint manufacturer. Do not use partial batches. Do not use multiple-component coatings that have been mixed beyond their pot life. Provide small quantity kits for touch-up painting and for painting other small areas. Mix only the components specified and furnished by the paint manufacturer. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.

### 3.08 PROCEDURES FOR THE APPLICATION OF COATINGS

- A. Conform to the requirements of SSPC PA-1. Follow the recommendations of the coating manufacturer including the selection of spray equipment, brushes,



rollers, cleaners, thinners, mixing, drying time, temperature and humidity of application, and safety precautions.

- B. Stir, strain, and keep coating materials at a uniform consistency during application. Power mix components. For multiple component materials, premix each component before combining. Apply each coating evenly, free of brush marks, sags, runs, and other evidence of poor workmanship. Use a different shade or tint on succeeding coating applications to indicate coverage where possible. Finished surfaces shall be free from defects or blemishes.
- C. Do not use thinners unless recommended by the coating manufacturer. If thinning is allowed, do not exceed the maximum allowable amount of thinner per gallon of coating material. Stir coating materials at all times when adding thinner. Do not flood the coating material surface with thinner prior to mixing. Do not reduce coating materials more than is absolutely necessary to obtain the proper application characteristics and to obtain the specified dry-film thicknesses.
- D. Remove dust, blast particles, and other debris from blast cleaned surfaces by dusting, sweeping, and vacuuming. Allow ventilator fans to clean airborne dust to provide good visibility of working area prior to coating applications. Remove dust from coated surfaces by dusting, sweeping, and vacuuming prior to applying succeeding coats.
- E. Apply coating systems to the specified minimum dry-film thicknesses as determined per SSPC PA-2.
- F. Apply primer immediately after blast cleaning and before any surface rusting occurs, or any dust, dirt, or any foreign matter has accumulated. Reclean surfaces by blast cleaning that have surface colored or become moist prior to coating application.
- G. Apply a brush coat of primer on welds, sharp edges, nuts, bolts, and irregular surfaces prior to the application of the primer and finish coat. Apply the brush coat prior to and in conjunction with the spray coat application. Apply the spray coat over the brush coat.
- H. Before applying subsequent coats, allow the primer and intermediate coats to dry for the minimum curing time recommended by the manufacturer. In no case shall the time between coats exceed the manufacturer's recommendation.
- I. Each coat shall cover the surface of the preceding coat completely, and there shall be a visually perceptible difference in applied shade or tint of colors.
- J. Applied coating systems shall be cured at 75°F or higher for 48 hours. If temperature is lower than 75°F, curing time shall be in accordance with printed recommendations of the manufacturer, unless otherwise allowed by the Owner's Representative.

- K. Assembled parts shall be disassembled sufficiently before painting or coating to ensure complete coverage by the required coating.

### 3.09 SURFACES NOT TO BE COATED

Do not paint the following surfaces unless otherwise noted in the drawings or in other specification sections. Protect during the painting of adjacent areas:

- A. Concrete walkways.
- B. Mortar-coated pipe and fittings.
- C. Stainless steel.
- D. Metal letters.
- E. Glass.
- F. Roofings.
- G. Fencing.
- H. Electrical fixtures except for factory coatings.
- I. Nameplates.
- J. Grease fittings.
- K. Brass and copper, submerged.
- L. Buried pipe, unless specifically required in the piping specifications.
- M. Fiberglass items, unless specifically required in the FRP specifications.
- N. Aluminum handrail, stairs, and grating.

### 3.10 PROTECTION OF SURFACES NOT TO BE PAINTED

Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process. Mask openings in motors to prevent paint and other materials from entering the motors.

### 3.11 SURFACES TO BE COATED

- A. The exact coating to be applied in any location is not designated by the descriptive phrases in the coating system titles such as “corrosive environment,” “buried metal,” or “submerged metal.” Coat surfaces with the specific coating systems as described below:
  - 1. Coat mechanical equipment, such as pumps, in accordance with the respective mechanical equipment specifications.
  - 2. Line all ductile iron piping and fittings per System No. 6A.
  - 3. Coat ductile iron piping in the wet well and between the wet well and valve vault per System No. 6A.
  - 4. Coat valves as described in the various valve specifications. Aboveground valves, or valves in vaults and structures, shall match the color of the connecting piping.
  - 5. Coat aluminum surfaces in contact with concrete per System No. 54.
  - 6. Provide asphaltic coating on buried pipe and fittings per Specification 402040.

### 3.12 DRY-FILM THICKNESS TESTING

- A. Measure coating thickness specified for carbon steel surfaces with a magnetic-type dry-film thickness gauge in accordance with SSPC PA-2. Provide certification that the gauge has been calibrated by a certified laboratory within the past six months. Provide dry-film thickness gauge as manufactured by Mikrotest or Elcometer.
- B. Test the finish coat of metal surfaces (except zinc primer and galvanizing) for holidays and discontinuities with an electrical holiday detector, low-voltage, wet-sponge type. Provide measuring equipment. Provide certification that the gauge has been calibrated by a certified laboratory within the past six months. Provide detector as manufactured by Tinker and Razor or K-D Bird Dog.
- C. Check each coat for the correct dry-film thickness. Do not measure within eight hours after application of the coating.
- D. For metal surfaces, make five separate spot measurements (average of three readings) spaced evenly over each 100 square feet of area (or fraction thereof) to be measured. Make three readings for each spot measurement of either the substrate or the paint. Move the probe or detector a distance of 1 to 3 inches for each new gauge reading. Discard any unusually high or low reading that cannot be repeated consistently. Take the average (mean) of the three readings as the spot measurement. The average of five spot measurements for each such 100-

square-foot area shall not be less than the specified thickness. No single spot measurement in any 100-square-foot area shall be less than 80%, nor more than 120%, of the specified thickness. One of three readings which are averaged to produce each spot measurement may underrun by a greater amount as defined by SSPC PA-2.

- E. Perform tests in the presence of the Owner's Representative.

### 3.13 REPAIR OF IMPROPERLY COATED SURFACES

If the item has an improper finish color or insufficient film thickness, clean and topcoat the surface with the specified paint material to obtain the specified color and coverage. Sandblast or power-sand visible areas of chipped, peeled, or abraded paint, feathering the edges. Then prime and finish coat in accordance with the specifications. Work shall be free of runs, bridges, shiners, laps, or other imperfections.

### 3.14 CLEANING

- A. During the progress of the work, remove discarded materials, rubbish, cans, and rags at the end of each day's work.
- B. Thoroughly clean brushes and other application equipment at the end of each period of use and when changing to another paint or color.
- C. Upon completion of painting work, remove masking tape, tarps, and other protective materials, using care not to damage finished surfaces.

END OF SECTION

## SECTION 099720 CHEMICAL-RESISTANT COATINGS FOR CONCRETE

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This section includes materials and installation of chemical-resistant coatings for the interior surfaces of raw wastewater manholes and wet wells.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. General Concrete Construction: 030500.
- B. Painting and Coating: 099000.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit manufacturer's data sheets showing the following information:
  - 1. Percent solids by volume of coating compound.
  - 2. Number of coats required to give the specified dry thickness.
  - 3. Minimum recommended dry thickness per coat for prime, intermediate, and finish coats.
  - 4. Recommended surface preparation.
  - 5. Recommended surface tensile strength of the concrete surface.
  - 6. Application instructions including recommended equipment and temperature limitation.
  - 7. Curing requirements and instructions.
- C. Applicator Qualifications:
  - 1. Manufacturer certification that Applicator has been trained and approved in the handling, mixing and application of the products to be used. Certification letter shall be dated within six months of bid date.
  - 2. The Applicator shall provide four (4) references which demonstrate previous successful projects completed for the specified structural protective coating system or comparable, during the last two (2) years.

3. Certification that the equipment to be used for applying the products has been manufactured or approved by the protective coating manufacturer and Applicator personnel have been trained and certified for proper use of the equipment. Certification letter shall be dated within six months of bid date.
4. Proof of any necessary federal, state, or local permits or licenses necessary for the project.

D. Submit material safety data sheets for each coating.

E. If required for warranty purposes, submit a written letter from the manufacturer stating that the coating Contractor's supervisor and each applicator performing Work on the project has been trained and approved by the manufacturer to apply the selected coating system. The manufacturer shall state whether or not it has verified that the Contractor is going to use the proper mixing, coating application, heating, and environmental control equipment for the specified coating products.

#### 1.04 SAFETY AND HEALTH REQUIREMENTS

A. In accordance with the requirements 29 CFR 1926 Subpart AA, the Contractor shall provide and require the use of personal protective and lifesaving equipment for all persons working in confined spaces.

B. Head and face protection and respiratory devices shall include protective helmets conforming to the requirements of ANSI Z 89.1 which shall be worn by all persons at all times while in the vicinity of the work when coatings are being applied. In addition, workers engaged in or near the work during sandblasting shall wear eye and face protection devices meeting the requirements of ANSI Z 87.1 and a respirator with appropriate filter.

C. Where ventilation is used to control potential exposures to workers, as set forth in Code of Federal Regulations Title 29 Section 1910.94 of the OSHA Regulations for Construction, ventilation shall be adequate to reduce the concentration of the air contaminant to the degree that a hazard to the worker does not exist. Methods of ventilation shall meet the requirements set forth in ANSI Z9.2.

D. Temporary ladders and scaffolding shall conform to the applicable requirements of 29 CFR 1926.502. The Contractor shall submit scaffolding plans to the Owner for review.

#### 1.05 QUALITY ASSURANCE

A. Applicator shall initiate and enforce quality control procedures consistent with applicable ASTM, NACE and SSPC standards and the protective coating manufacturer's recommendations.

## 1.06 WARRANTY

- A. Applicator shall warrant all work against defects in materials and workmanship for a period of one (1) year, unless otherwise noted, from the date of final acceptance of the project. Applicator shall, within a reasonable time after receipt of written notice thereof, repair defects in materials or workmanship which may develop during said one (1) year period, and any damage to other work caused by such defects or the repairing of same, at his own expense and without cost to the Owner.

## PART 2- MATERIALS

### 2.01 100% SOLIDS EPOXY COATING

- A. Coating shall be a 100% solids, two-component epoxy.
- B. Characteristics shall be as follows:
  - 1. Tensile Strength on concrete: 6,000 psi (minimum) per ASTM D638.
  - 2. Surface Hardness: 80 minimum, Shore "D" per ASTM D2240.
  - 3. Compressive Strength: 10,000 psi per ASTM D695
  - 4. Impact Resistance: 160 inch-pounds (minimum).
- C. Product: Tnemec Series 436 Perma-Shield FR, Raven 405, Warren Environmental 301.
- D. When recommended, apply resurfacer to a minimum thickness of 1/16 inch on all concrete surfaces. When recommended by manufacturer, apply primer to seal concrete and reduce off-gassing. Apply topcoat to a minimum total dry film thickness of 80 mils.

### 2.02 REPAIR MATERIALS

- A. Repair materials shall be used to: fill voids, bugholes, structurally reinforce and/or rebuild surfaces, etc. as determined necessary by the engineer and protective coating applicator. Repair materials must be compatible with the specified coating and shall be applied in accordance with the manufacturer's recommendations.
- B. The following products may be accepted and approved as compatible repair basecoat materials for approved topcoating for use within the specifications:
  - 1. 100% solids, solvent-free grout specifically formulated for approved topcoating compatibility. The grout manufacturer shall provide instructions for trowel or spray application and for approved topcoating procedures.

2. Factory blended, rapid setting, high early strength, non-shrink cementitious or epoxy repair mortar that can be trowelled or pneumatically spray applied may be approved if specifically formulated to be suitable for approved topcoating. Such repair mortars should not be used unless their manufacturer provides information as to its suitability for topcoating with the approved topcoating. Project specific submittals should be provided including application, cure time and surface preparation procedures which

### 2.03 ABRASIVES FOR SURFACE PREPARATION OF CONCRETE

Abrasives used for preparation of concrete surfaces shall be per the coating manufacturer's recommendations and approved by CARB and Santa Barbara County Air Pollution Control District.

## PART 3- EXECUTION

### 3.01 COATING SYSTEM

- A. Materials including primer, intermediate, and finish coats shall be produced by the same manufacturer. Thinners, cleaners, driers, and other additives shall be as recommended by the coating manufacturer.
- B. Deliver coatings to the jobsite in the original, unopened containers.

### 3.02 PROTECTION OF SURFACES NOT TO BE COATED

Remove, mask, or otherwise protect hardware, lighting fixtures, switchplates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be coated. Provide drop cloths to prevent coating materials from falling on or marring adjacent surfaces. Protect working parts of mechanical and electrical equipment from damage during surface preparation and coating process. Mask openings in motors to prevent coating and other materials from entering the motors.

### 3.03 WEATHER CONDITIONS

- A. Do not coat in the rain, wind, snow, mist, and fog or when surface temperatures are less than 5°F above the dew point.
- B. Temperature of the surface to be coated should be maintained between 70°F and 110°F during application. Prior to and during application, care should be taken to avoid exposure of direct sunlight or other intense heat source to the structure being coated.



### 3.04 SURFACE PREPARATION

- A. Remove all existing protective coatings where present unless indicated otherwise on the drawings.
- B. Do not apply coating until concrete has cured at least 30 days. Finish concrete surfaces per Section 030500. In placing concrete floors, after the proper leveling of the concrete, it shall be wood float finished, followed by a single pass metal trowel finish to produce a relatively laitance-free substrate. Do not use lubricants or release agents on tools. Do not use curing compound on surfaces that are to be coated.
- C. Concrete surfaces on which coating is to be applied shall be of even color, gray or gray-white. The surface shall have no pits, pockets, holes, or sharp changes of surface elevation. The concrete surfaces shall also be free of fins, projections, bugholes, honeycombs, and loosely adhering concrete, dirt, and dust particles. Scrubbing with a stiff-bristle fiber brush shall produce no dusting or dislodging of cement or sand. Sprinkling water on the surface shall produce no water beads or standing droplets. Concrete and masonry shall be free of laitance and slick surfaces. The grain of the concrete surface to touch shall not be rougher than that of No. 10 mesh sand.
- D. Repair existing deteriorated concrete per Section 030500, Finish F-4. Fill spalled areas with grout to provide a surface level with the surrounding area. Sand blast exposed rebar to remove rust prior to grout installation. Also prior to grout application coat existing concrete structures with a corrosion inhibitor such as Sika FerroGard or equal. Confirm with coating manufacture in writing for compatibility with Sika FerroGard.
- E. Detergent water cleaning and hot water blasting may be necessary to remove oils, grease or other hydrocarbon residues from the concrete. Whichever method(s) are used, they shall be performed in a manner that provides a uniform, sound, clean, neutralized surface that is not excessively damaged.
- F. Prior to coating new concrete walls and ceilings, determine the presence of capillary moisture per ASTM D4263, except as modified below. Tape a 4-foot by 4-foot sheet of polyethylene plastic to the concrete surface to be coated. Allow the plastic sheet to remain in place at least 24 hours. After the specified time has elapsed, remove the plastic sheet and visually examine both the underside of the plastic sheet and the concrete surface beneath it. There shall be no indication of moisture on either surface. If moisture is indicated, allow additional curing time for the concrete and then retest. Provide one test sheet for every 500 square feet or portion thereof of concrete surface to be coated. For walls, provide one test sheet for each 10 feet of vertical rise in all elevations starting within 12 inches of the floor or base slab.

- G. the concrete surface beneath it. There shall be no indication of moisture on either surface. If moisture is indicated, allow additional curing time for the concrete and then retest. Provide one test sheet for every 500 square feet or portion thereof of concrete surface to be coated. For walls, provide one test sheet for each 10 feet of vertical rise in all elevations starting within 12 inches of the floor or base slab.
- H. If moisture is indicated, allow additional curing time for the concrete and then retest. Provide one test sheet for every 500 square feet or portion thereof of concrete surface to be coated. For walls, provide one test sheet for each 10 feet of vertical rise in all elevations starting within 12 inches of the floor or base slab.
- I. Grout the area between the concrete structure and manhole ring, and any other penetration with a flexible grout or gel. A termination groove “key” cut into the substrate between the bottom of the manhole frame and concrete is recommended for placement of the flexible grout or gel. The “key” shall be a minimum ¼”w x ¼”d, cut at a minimum 45° angle (60° maximum).
- J. Surfaces to receive protective coating shall be cleaned and abraded to produce a sound surface with profile to meet as a minimum ICRI CSP4 to CSP6 profile and porosity to provide a strong bond between the protective coating and the substrate. Use of a high pressure water cleaning using equipment capable of a minimum 4,000 psi at 3.5 gpm with a turbo head jet nozzle, high pressure water jetting (refer to SSPC-SP 13/NACE No.6), abrasive blasting, shotblasting, grinding, scarifying, or acid etching may be used.
- K. Do not apply coatings to concrete when the concrete is outgassing. Apply coatings only when the concrete surface temperature is stable and not rising.
- L. Surfaces to receive protective coating shall be dry to the touch and or with no visible dampness. If required, drying may be accomplished by a minimum of 20 minutes of a heated, forced air blower. The drying shall be to the specification dictated by the coating manufacturer and its trained applicator.

### 3.05 REPAIR MATERIALS APPLICATION

- A. Repair materials shall meet the specifications herein. The materials shall be trowel or spray applied utilizing proper equipment on to specified surfaces. The material thickness shall be a minimum of ¼ inch thick.
- B. If using approved cementitious repair materials, such shall be troweled to provide a smooth surface with an average profile equivalent to coarse 60 grit sandpaper to optimally receive the protective coating. No bugholes or honeycomb surfaces should remain after the final trowel procedure of the repair mortar.

- C. The repair materials shall be permitted to cure according to manufacturer recommendations. Curing compounds should not be used unless approved for compatibility with the specified protective coating.
- D. Application of the repair materials, if not performed by the coating certified applicator, should be inspected by the protective coating certified applicator to ensure proper finishing for suitability to receive the specified coating.
- E. After abrasive blast is performed, all surfaces shall be inspected for remaining laitance prior to protective coating application. Any evidence of remaining contamination or laitance shall be removed by additional abrasive blast, shotblast or other approved method. If repair materials are used, refer to these specifications for surface preparation. Areas to be coated must also be prepared in accordance with these specifications after receiving a cementitious repair mortar and prior to application of the approved coating.

### 3.06 COATING APPLICATION

- A. Application procedures shall conform to the recommendations of the protective coating manufacturer, including material handling, mixing, environmental controls during application, safety, and spray equipment.
- B. The spray equipment shall be specifically designed to accurately ratio and apply the specified protective coating materials and shall be regularly maintained and in proper working order.
- C. The protective coating material must be spray applied by a Certified Applicator of the protective coating manufacturer.
- D. If necessary, subsequent topcoating or additional coats of the protective coating should occur as soon as the basecoat becomes tack free, no later than the recoat window for the specified products. Additional surface preparation procedures will be required if this recoat window is exceeded.
- E. The entire coating shall be pinhole free.
- F. See drawings for structures to which coating is to be applied.

### 3.07 HOLIDAY (CONTINUITY) TESTING OF APPLIED COATING

After the protective coating has set hard to the touch it shall be inspected with high-voltage holiday detection equipment by the Contractor and witnessed by the Owners Representative. Surface shall first be dried, an induced holiday shall then be made on to the coated concrete or metal surface and shall serve to determine the minimum/maximum voltage to be used to test the coating for holidays at that particular area. The spark tester shall be initially set at 100 volts per 1 mil (25 microns) of film thickness applied but may be adjusted as necessary to detect the induced holiday (refer to NACE SP01889 or ASTM

D4787 Continuity Verification of Liquid or Sheet Linings Applied to Concrete substrates). All detected holidays shall be marked and repaired by abrading the coating surface with grit disk paper or other hand tooling method. After abrading and cleaning, additional protective coating material can be hand applied to the repair area. All touch-up/repair procedures shall follow the protective coating manufacturer's recommendations.

### 3.08 ADHESION TESTING

- A. The adhesion tests shall be performed on each structure and for every 200 square feet of the structures. Adhesion testing shall be conducted by the Contractor after the lining or coating system has cured per manufacturer instruction and in accordance with ASTM D4541 (Steel) or ASTM 7234 (Concrete). A minimum of one 20 mm dolly shall be affixed to the lined surface of the structure at the upper section, mid-section and at the bottom, unless otherwise specified in the Special Provisions.
- B. Each testing location shall be identified by the Engineer. The adhesive used to attach the dollies to the liner shall be a two-part 100% solids epoxy adhesive with a tensile strength greater than the tensile strength of the lining system. Affix the 20 mm dollies to the lining surfaces and allow it to cure in accordance with the manufacturer's instructions. The lining material and dollies shall be adequately prepared to receive the adhesive. Prior to pull test, the Contractor shall utilize a scoring device to cut through the coating until the substrate is reached. Extreme care shall be required while scoring to prevent micro cracking in the coating, since cracks may cause failures at diminished strengths. Failure due to improper dolly adhesive or scoring shall require retesting.
- C. The pull tests in each area shall meet or exceed 200 psi. and shall include subbase adhered to the back of the dolly or no visual signs of coating material in the test hole. Pull tests with results between a minimum 150 psi and 200 psi shall be acceptable if more than 50% of the subsurface is adhered to the back of the dolly. A test result can be discarded, as determined by the Engineer, if there is a valid nonstatistical reason for discarding the test results as directed by Sections 8.4 and 8.5 of ASTM D4541 and ASTM D7234. If any test fails, a minimum of three additional locations in the section of the failure shall be tested, as directed by the Engineer. If any of the retests fail, all loosely adhered or unadhered liner in the failed area, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. If a structure fails the adhesion test, one additional structure or 10% of the initial number of structures selected for testing shall be tested at the discretion of the Engineer and/or as specified in the Special Provisions. All touch-up/repair procedures shall follow the protective coating manufacturer's recommendations.

### 3.09 DRY-FILM THICKNESS TESTING

The mil thickness will be measured and confirmed with the scored and pulled test samples performed under Part 3.08.

END OF SECTION

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## SECTION 099752 COLD APPLIED WAX TAPE COATING

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials and application of a three-part, cold-applied wax tape coating system for buried piping per NACE SP0375, Section 4 except as modified herein.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

Polyethylene Sheet Encasement (AWWA C105): 099754.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit manufacturer's catalog data sheets and application instructions.

### PART 2- MATERIALS

#### 2.01 PRIMER

- A. Primer shall be a blend of petrolatums, plasticizers, and corrosion inhibitors having a paste-like consistency. The primer shall comply with NACE SP0375 and shall have the following properties:
  - 1. Pour Point: 100°F to 110°F.
  - 2. Flash Point: 350°F.
  - 3. Coverage: 1 gallon per 100 square feet.
- B. Primer shall be Trenton Wax Tape Primer, Denso Paste Primer, or equal.

#### 2.02 WAX TAPE

- A. Wax tape shall consist of a synthetic-fiber felt, saturated with a blend of microcrystalline wax, petrolatums, plasticizers, and corrosion inhibitors, forming a tape coating that is easily formable over irregular surfaces. The tape shall comply with NACE SP0375 and shall have the following properties:
  - 1. Saturant Pour Point: 115°F to 120°F.

2. Thickness: 50 to 70 mils.

3. Tape Width: 6 inches.

B. Wax tapes used for pipe soil-to-air transitions shall be UV light stable so as not to degrade in the presence of sunlight.

C. Wax tape shall be Trenton No. 1 Wax Tape, Denso "Densyl Tape," or equal.

### 2.03 PLASTIC WRAPPER

A. Wrapper shall be a polyvinylidene chloride plastic with three 50-gauge plies wound together as a single sheet. The wrapper shall have the following properties:

1. Color: Clear.

2. Thickness: 1.5 mils.

3. Tape Width: 6 inches.

B. Plastic wrapper shall be Trenton Poly-Ply, Denso Tape PVC Self-Adhesive, or equal.

### 2.04 POLYETHYLENE SHEET COATING

See Section 099754.

## PART 3- EXECUTION

### 3.01 WAX TAPE COATING APPLICATION

A. Surfaces shall be clean and free of dirt, grease, water, and other foreign material prior to the application of the primer and wax tape.

B. Apply primer by hand or brush to fitting surfaces. Work the primer into crevices and completely cover exposed metal surfaces.

C. Apply the wax tape immediately after the primer application. Work the tape into the crevices around fittings. Apply the wax tape by pressing and molding the tape into conformity with the surface so that it does not bridge over irregular surfaces configurations. Begin wrapping approximately 3 inches behind the area to be wrapped. If starting at a straight edge, wrap the tape spirally around the pipe while touching the end edge before starting the angle to begin the spiral. If the previous roll is headed in a downward direction, tuck the next roll under the previous roll. Stretch each roll tight as wrapping continues to avoid air bubbles.



- D. Wrap the wax tape spirally around the pipe and across the fitting. Use a minimum overlap of 50% of the tape width. Apply tape to flanges, mechanical and restrained joint bolts, nuts and glands, and grooved-end couplings to 6 inches beyond each side of the item.
- E. Work the tape into the crevices and contours of irregularly shaped surfaces and smooth out so that there is a continuous protective layer with no voids or spaces under the tape.
- F. After application, seal the overlap seams of the tape by hand by tapering and pressing the seam, attempting to create a continuous surface. There shall be no air pockets underneath the tape. The tape shall have direct intimate contact with the pipe surface.
- G. On vertical sections of the piping, such as at pipe-to-soil transitions, wrap the pipe starting from the bottom and proceeding upward so that downward flowing water and backfill do not catch in a seam.
- H. Overwrap the completed wax tape installation with the plastic wrapping material. Wrap spirally around the pipe and across the fitting. Use a minimum overlap of 55% of the tape width and apply two layers or applications of overwrap. Secure plastic wrapper to pipe with adhesive tape.

### 3.02 APPLICATION OF POLYETHYLENE SHEET COATING TO BURIED PIPING

Wrap completed wax tape coating system with polyethylene film per Section 099754 and secure around the adjacent pipe circumference with adhesive tape.

### 3.03 HANDLING AND INSTALLING WAX-TAPE COATED PIPE

- A. Handle pipe in a manner to minimize damage to the coating. Equipment used for the handling of coated pipe shall be designed and constructed to avoid damaging the protective coating system. Inspect supported areas of the pipe prior to installation. Repair damaged areas before installation.
- B. The pipeline trench shall be free of rocks, foreign matter, and projections that could damage the coating system.

END OF SECTION

## SECTION 099754 POLYETHYLENE SHEET ENCASEMENT (AWWA C105)

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials and installation of a polyethylene sheet encasement for buried iron pipe, fittings, and valves.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Trenching, Backfilling, and Compacting: 312316.
- B. General Piping Requirements: 400500.
- C. Ductile-Iron Pipe: 402040.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with Special Provisions and Section 013300.
- B. Submit manufacturer's catalog literature and product data sheets describing the physical, chemical, and electrical properties of the encasement material.

### PART 2- MATERIALS

#### 2.01 POLYETHYLENE SHEET COATING

- A. The encasement shall consist of low-density polyethylene wrap of at least 8-mil thickness conforming to AWWA C105. Color: Black.
- B. Polyethylene encasement for ductile-iron pipe shall be supplied as a flat tube meeting the dimensions of Table 1 in AWWA C105 and shall be supplied by the ductile-iron pipe manufacturer.

#### 2.02 PLASTIC ADHESIVE TAPE

- A. Tape shall consist of polyolefin backing and adhesive which bonds to common pipeline coatings including polyethylene.
- B. Minimum Width: 2 inches.
- C. Products: Canusa Wrapid Tape, Tapecoat 35, Polyken 934, AA Thread Vinyl Polywrap Tape, or equal.

## PART 3- EXECUTION

### 3.01 APPLICATION OF MOLDABLE MASTIC FILLER TO IRREGULAR ADJACENT SURFACES

When the adjacent joints are bell-and-spigot or mechanical joints and any associated welding specifications do not require an external full fillet weld, apply a moldable mastic filler (per Section 400500) at the step-down area prior to the application of the sheet encasement and tape.

### 3.02 APPLYING SHEET COATING TO BURIED PIPING AND FITTINGS

- A. Apply wrapping per AWWA C105 as modified herein.
- B. Apply a single wrapping.
- C. Install the polyethylene sheet coating to completely encase the pipe and fittings to provide a watertight corrosion barrier. Continuously secure overlaps and ends of sheet and tube with polyethylene tape. Make circumferential seams with two complete wraps, with no exposed edges. Tape longitudinal seams and longitudinal overlaps, extending tape beyond and beneath circumferential seams.
- D. Wrap bell-spigot interfaces, restrained joint components, and other irregular surfaces with wax tape or moldable sealant prior to placing polyethylene encasement.
- E. Minimize voids beneath the polyethylene. Place circumferential or spiral wraps of polyethylene tape at 2-foot intervals along the barrel of the pipe to minimize the space between the pipe and the polyethylene.
- F. Overlap adjoining polyethylene tube coatings a minimum of 1 foot and wrap prior to placing concrete anchors, collars, supports, or thrust blocks. Hand wrap the polyethylene sheet, apply two complete wraps with no exposed edges to provide a watertight corrosion barrier, and secure in place with 2-inch-wide plastic adhesive tape.

### 3.03 APPLYING SHEET COATING TO BURIED VALVES

- A. Wrap flanges and other irregular surfaces with wax tape or moldable sealant. Press tightly into place leaving no voids underneath and a smooth surface under coating for polyethylene sheet.
- B. Wrap with a flat sheet of polyethylene. Place the sheet under the valve and the flanges or joints with the connecting pipe and fold in half. Extend the sheet to the valve stem and secure the sheet in place with 2-inch-wide plastic adhesive tape. Apply a second layer and secure with tape. Make two complete wraps, with no exposed edges, to provide a watertight corrosion barrier. Secure the sheets with

tape around the valve stem below the operating nut and around the barrel of the connecting pipe to prevent the entrance of water and soil. Place concrete anchor and support blocks after the wrap has been installed.

#### 3.04 APPLYING SHEET COATING TO BURIED FLEXIBLE PIPE COUPLINGS

- A. Wrap irregular surfaces with wax tape or moldable sealant. Press tightly into place leaving no voids underneath and a smooth surface under coating for polyethylene sheet.
- B. Apply two layers or wraps around the coupling. Overlap the adjoining pipe or fitting a minimum of 1 foot and secure in place with tape. Provide sufficient slack in polyethylene to allow backfill to be placed around fitting without tearing polyethylene. Apply tape around the entire circumference of the overlapped section on the adjoining pipe or fitting in two complete wraps, with no exposed edges, to provide a watertight corrosion barrier.

#### 3.05 REPAIR OF POLYETHYLENE MATERIAL

Repair polyethylene material that is damaged during installation. Use polyethylene sheet, place over damaged or torn area, and secure in place with 2-inch-wide plastic adhesive tape.

#### 3.06 APPLYING SHEET COATING TO EXISTING BURIED PIPING

When connecting polyethylene-encased pipe or fittings to existing pipe, expose existing pipe, thoroughly clean the surface, and securely tape the end of the polyethylene to the existing as specified above. When the existing pipe is polyethylene encased, wrap new polyethylene encasement over the existing, with overlap of at least 2 feet. Tape securely as specified above.

#### 3.07 BACKFILL FOR POLYETHYLENE-WRAPPED PIPE, VALVES, AND FITTINGS

Place sand backfill within 1 foot of the pipe, valves, and fittings wrapped with polyethylene encasement per Section 312316.

#### 3.08 INSTALLATION AND REPAIR OF POLYETHYLENE AT SERVICE TAPS

- A. Wrap two or three layers of polyethylene adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted.
- B. Mount the tapping machine on the pipe area covered by the polyethylene tape. Then make the tap and install the corporation stop directly through the tape and polyethylene.
- C. After making the direct service connection, inspect the entire circumferential area for damage and make repairs.

- D. To minimize the possibility of dissimilar metal corrosion at service connections, wrap the corporation stop a minimum clear distance of 3 feet of copper service pipes with polyethylene or dielectric tape.

END OF SECTION

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## SECTION 260101 BASIC ELECTRICAL REQUIREMENTS

### PART 1- GENERAL

#### 1.01 SCOPE

- A. The Contractor shall furnish, install, connect, make operable and test all electrical equipment and other systems with electrical connections shown on the Drawings or called for in the Specifications or in Change Orders. In connection therewith, the Contractor shall also furnish and install all necessary devices, switches, circuit breakers, hardware and systems required to make said equipment properly and safely operable.

#### 1.02 SECTION INCLUDES

- A. Temporary electrical power source, all required connections, and sufficient fuel shall be provided. All temporary generator installations shall comply with City of Guadalupe noise ordinance or requirements.
- B. All new electrical work associated with the replacement of the existing lift station, including PG&E swing service relocation. Notify Owner's Representative two weeks prior to the date that the new service equipment is intended to be energized.
- C. All luminaires, mounting provisions, backing, accessories, lamps, switches, timers, receptacles, faceplates, photoelectric controls, relays, contactors, bypass switches, and all necessary appurtenances for a complete lighting and receptacle layout.
- D. Complete testing of the electrical equipment for operation of the new lift station shall be accomplished using the new electrical service prior to removal of the temporary pumps used for bypassing the existing lift station.
- E. Demolition and removal where indicated, of existing electrical equipment.
- F. Grounding of equipment, services, and neutrals as indicated and/or required and as indicated on Drawings.
- G. Electrical work and equipment for connection of equipment as specified herein and/or shown on Drawings.
- H. Electrical rough-in and connections of equipment furnished under other Divisions of the work or as required.
- I. All cutting, excavation, backfill, conduit encasement, and restoration of disturbed surfaces required in conjunction with the electrical work.

- J. Core drilling, conduit sleeves, sealing and waterproofing, metal frames, backings, equipment bracing, and supports required for installation of electrical conduits, fixtures, and equipment not specified elsewhere.
- K. Prime painting of electrical surfaces requiring finish painting.
- L. Miscellaneous systems and equipment as hereinafter specified, as shown on Drawings, or as required.
- M. Submittals, completion data, tests, identifications, record drawings, maintenance and operating instructions, and warranties.
- N. The word "provide" means: "To furnish, install, and electrically connect under this Division of the work."

#### 1.03 ROUGH-IN

- A. Verify final locations for rough-ins for each device and equipment with field measurements and with the requirements of the actual device or piece of equipment to be connected,
- B. Refer to equipment specifications in other Divisions for rough-in requirements.

#### 1.04 ELECTRICAL INSTALLATIONS

- A. Coordinate electrical equipment and materials installation with all other components.
- B. Verify all dimensions by field measurements. The Drawings serve as working drawings only, indicating diagrammatically the general layout of the systems and their various components and equipment.
- C. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
- D. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the Work.
- E. Install electrical equipment to facilitate maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
- F. American National Standards Compliance: Comply with National Electrical Installation Standards NECA 1-2015 'Standard Practices for Good Workmanship in Electrical Contracting' as published by the National Electrical Contractors Association.



## 1.05 INTERRUPTIONS OF EXISTING SERVICES

- A. Interruption of electrical utilities considered to be "critical" by the Owner shall be performed only at times approved by them during the hours from 12:00 midnight to 4:00 a.m. with a maximum down time not to exceed four (4) hours. Shutdowns considered non-critical may be performed during normal working hours at times and of durations approved by Owner, unless noted otherwise.
- B. At the time of any interruption or cut-off, have adequate materials and labor readily available so that the Work can be completed without delay and within the approved schedule. Include all required temporary services to maintain power, alarm, and signal to areas where these systems cannot be interrupted at any time. Refer to notes on Drawings for additional requirements. Provide temporary generator backup for the electrical loads affected by the shutdowns of existing systems.

## 1.06 CUTTING AND PATCHING

- A. Do all miscellaneous cutting, drilling, and patching necessary and normally required at the time of actually installing this work. Patching shall be of the same materials, workmanship, and finish as the original or surrounding work to the complete satisfaction of the Owner's Representative. Seal all voids or spaces around penetrations with dry-pack, waterproof mastic grout, escutcheons, or collars. Do not cut structural framing, walls, floors, decks and other members intended to withstand stress, except with Owner's Representative written authorization. Authorization shall be granted only where there is no other reasonable method for completing electrical work and where proposed cutting is approved by Owner's Representative and clearly does not weaken the structure.
- B. Core Drilling Concrete: Where authorized, cut openings through concrete (for conduit penetrations and similar services) by core drilling. Do not cut by hammer-driven chisel or drill. Use ground penetrating radar to locate structural steel prior to drilling. Avoid cutting reinforcing steel.
- C. All costs required to accomplish cutting, repairing, sealing, and firestopping of new work in existing areas to accommodate the electrical work shall be paid for by the Contractor at no increase in contract cost.

## 1.07 SUBMITTALS

- A. Provide minimum one electronic copy in text searchable PDF compatible format for each submittal.
- B. Additional copies may be required by individual sections of these Specifications. Refer to subsequent sections for specific submittal requirements.

- C. Submittals for electrical equipment shall include manufacturer's installation instructions.

#### 1.08 SUBSTITUTIONS

- A. Refer to the Conditions of the Contract (General Provisions) and Division 1 for substitution requirements.

#### 1.09 RECORD DOCUMENTS

- A. Refer to the Division 1 for requirements. The following paragraphs supplement the requirements of Division 1.
- B. Obtain from the Owner's Representative at cost a complete set of applicable bond prints. On these systematically and accurately keep an up-to-date and legible dimensional record of all work installed differently from the location or manner indicated by the Drawings, as well as exact conduit routing, locations of stub-outs, and hidden or underground features. Locate dimensionally to permanent points of reference. Have these Drawings readily available for reference and review. When job status permits, submit to the Owner and then amend and/or correct and resubmit if requested.
- C. The record drawing information procedure outlined under Paragraph B above shall be coordinated with and reviewed by the Owner's full-time Inspector during the course of construction and shall have his signed approval before submission to the Owner.
- D. Mark Specifications to indicate any approved substitutions, Change Orders, actual equipment, and materials used. This data shall be included with submittals.

#### 1.10 OPERATIONS AND MAINTENANCE DATA

- A. Refer to the Division 1 Operation and Maintenance Data for procedures and requirements for preparation and submittal of maintenance manuals. Refer to the Division 1 Spare Parts and Maintenance Materials for requirements pertaining to spare parts.
- B. Operating Instructions: In addition to the information required by Division 1 for Maintenance Data, include written instructions by manufacturer, fabricator, or installer of equipment or systems, detailing procedures to be followed by Owner in operation, control, shut-down, and testing of each operating item of the equipment and each electrical system.
- C. Maintenance Manuals: In addition to the information required by Division 1 for Maintenance Data, compile information provided for Owner's maintenance of each system of operating equipment, including wiring and control wiring diagrams, lubrication, emergency control, parts replacement, spare parts

inventory recommendation, listing of tools and accessories needed for maintenance, and similar instructions.

#### 1.11 MANUFACTURER'S DIRECTIONS

- A. Follow manufacturer's directions and recommendations in all cases where the manufacturers of articles used for this work furnish directions covering points not shown or specified.
- B. Delivery, storage, and handling: Deliver equipment in containers, sections or lengths that can be moved past obstructions in delivery path. Store equipment indoors in clean dry space with uniform temperature to prevent condensation. Protect from exposure to dirt, fumes, water, corrosive substances, and physical damage.

#### 1.12 MARKING

- A. In general, and except as modified by details or elsewhere herein, before requesting the Engineer to make final observation, identify all electrical distribution equipment, circuit breakers, and other equipment by means of neat, approved labels, decals, brass tags, engraved plastic laminate or metal strips, neatly painted signs or by other approved means. Provide manufacturer's standard vinyl-cloth self-adhesive cable/conductor markers of wrap-around type, either pre-numbered plastic coated type or write-on type with clear plastic self-adhesive cover flap, numbered to show circuit identification. Where nameplates are indicated, provide engraving stock plastic laminate, complying with FS L-P-387, in sizes and thicknesses indicated, engraved with engraver's standard letter style of sizes and wording indicated, black face and white core plies (letter color). Provide thickness of 1/16", except as otherwise indicated. Punch plastic laminate for mechanical fastening and provide stainless steel rivets or self-tapping stainless steel screws.

#### 1.13 MOUNTING

- A. Provide all materials and accessories necessary to properly mount and secure equipment furnished and/or installed under the electrical work in compliance with all applicable codes and authorities.
- B. Seismic restraints and anchorage for equipment shall comply with the requirements of 2016 edition of Title 24, Part 2, California Building Code, Chapter 16, Section 1613.

#### 1.14 TESTS

- A. Perform all electrical tests as required or as directed. Provide all materials, labor, and equipment necessary for performance of these tests and at completion of the work perform a complete "in-service" operation of the entire electrical lighting, power, signal, communications, and alarm systems to show

compliance with the Drawings and Specifications. Replace any work showing faults under tests without additional cost to the Owner.

- B. Where NETA electrical tests are indicated, testing shall be performed in accordance with NETA ATS-2009 (International Electrical Testing Association) - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems.

#### 1.15 CLEANING

- A. During construction and upon completion of the work, remove from the site all debris and excess materials, tools, scaffolding, etc., resulting from this work. Clean all equipment, including luminaires, distribution and control equipment, and enclosures, free from dust, dirt, grease, paint, etc.

PART 2- MATERIALS [NOT USED]

PART 3- EXECUTION [NOT USED]

END OF SECTION

## SECTION 260519 WIRES AND CABLES

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of electrical wire and cable work is indicated by Drawings and as specified herein.
- B. Types of wire and cable in this section include conductors having insulation rated for use on power systems with voltages of not more than 600 volts, nominal.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical wire and cable products of types and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. NEMA/ICEA Compliance: Comply with NEMA/Insulated Cable Engineers Association standards pertaining to materials, construction, and testing of wire, cable, and accessories.
- C. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to electrical wires, cables, and accessories and provide products and components that have been listed and labeled by an NRTL such as UL or equal.
- D. ANSI/ASTM: Comply with ANSI/ASTM standards pertaining to construction of wire and cable.
- E. IEEE Compliance: Comply with IEEE standards pertaining to wire and cable.
- F. California Electrical Code (CEC) Compliance: Comply with CEC as applicable to construction and installation of electrical wire, cable and accessories.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data on 600 volt wire and cable and accessories.

## PART 2- MATERIALS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. 600 Volt Wire and Cable Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to BICC, General Cable, Southwire, or equal.
- B. Accessories Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to AMP Products Corp., Burndy Corp., Ideal Industries, Inc., Penn-Union Co., Reliable Electric Co., Thomas and Betts Corp, 3M, or equal.

### 2.02 GENERAL

- A. Except as otherwise indicated, provide wire and cable of manufacturer's standard materials as indicated by published product information, designed and constructed as recommended by manufacturer, and as required for the installation.
- B. Provide new wire and cable in unbroken reels or containers of recent manufacture bearing NRTL Label, manufacturer's trademark, and type and size of wire or cable.
- C. Provide electrical accessories as recommended by connector and terminal manufacturer for intended applications.

### 2.03 600 VOLT WIRE AND CABLE

- A. Unless otherwise indicated, provide 600 volt insulated soft-drawn copper and minimum 12 AWG unless otherwise indicated. Conductors shall be Type THWN/THHN gasoline and oil resistant. Conductors shall be annealed copper, insulated with flame retardant, moisture and heat resistant thermoplastic, jacketed with abrasion, moisture, gasoline, and oil resistant nylon. Comply with CEC and the following for color coding of conductors. Color code all secondary service, feeder, and branch circuit conductors. 240 volt system neutrals shall be white. 240 volt single phase ungrounded conductors for Phase A and Phase B shall be black and red, respectively. The color coding for conductors 6 AWG and smaller shall be continuous along the entire length.
- B. Provide solid or stranded conductors for sizes smaller than 8 AWG. Provide stranded conductors for sizes 8 AWG and larger.

### 2.04 ACCESSORIES

- A. Provide electrical insulating tape, heat-shrinkable insulating tubing and boots, solder, electrical soldering flux, wire nuts, and cable ties as recommended for

use by accessories manufacturers for type services indicated. Splices in wet locations shall be suitable for continuous operation under water.

- B. Use compression type connectors for all taps, joints, and splices. Solderless connectors may be used for conductors smaller than 8 AWG.

## PART 3- EXECUTION

### 3.01 GENERAL

- A. Install electrical wires and cables where indicated, in compliance with this specification and according to manufacturer's written instructions and recognized industry practices.
- B. Install all wiring in conduit unless otherwise noted.
- C. Complete all work that may cause wire and cable damage before pulling into conduit. Provide sufficient slack at the terminations to allow for proper connections.
- D. Group all communication conductors and power conductors that are smaller than 2/0 AWG in panelboards, cabinets, pull boxes, and switchboard wireways; tie with plastic ties; and fan out to terminals.
- E. Wires and cables shall be lubricated with an NRTL listed commercial lubricant while they are being pulled. Use lubricants that are specifically recommended by the cable manufacturer. Do not exceed manufacturer's recommended maximum allowable pulling force.
- F. Where connections are made in underground structures or in junction boxes in wet locations, make completely watertight. Install cables in underground structures with the longest route parallel to the walls. Support cables in underground structures by cable racks and secure to rack insulators with nylon cord or self locking nylon cable ties.
- G. Prepare cables and wires by cutting and stripping covering armor, jacket, and insulation properly to ensure uniform and neat appearance where cables and wires are terminated. The stripped length of bare conductor shall not be longer than required for the terminal, lug, or connector.
- H. Trim cables and wires as short as practicable and arrange routing to facilitate inspection, testing, and maintenance.
- I. Connect electrical wire and cable to equipment wire and cable in accordance with equipment manufacturer's written instructions and wiring diagrams. Wherever possible, mate and match conductors of electrical connections for proper interface between electrical power supplies and installed equipment.

- J. Refer to Division 26 "Electrical Identification" section for identification of electrical power supply conductor terminations with markers approved by Engineer as to types, colors, letter sizes, and marker sizes. Affix markers at each point of termination as close as possible to each point of connection.
- K. Make conductors continuous between outlets or junction boxes. Make up splices only in junction boxes, outlet boxes, auxiliary gutters, or underground structures. Splices and taps shall have mechanical strength and insulation equivalent or greater than the conductor material.
- L. Tighten pressure type lugs on panels and equipment and then re-tighten 24 hours or more later.
- M. Tighten wire-binding connector screws firmly.

### 3.02 FIELD QUALITY CONTROL

- A. Insulation resistance tests: Test each complete circuit prior to energizing. Insulation resistance between conductors and between each conductor and ground shall not be less than 25 megohms. Repair or replace wires or cables in circuits and repeat the test.
- B. Before energization, test cable and wire for continuity of circuitry and for short circuits. Correct malfunctions when detected, at no additional cost to Owner.
- C. After wire and cable hookups, energize circuitry and demonstrate functioning of each system in accordance with requirements.

END OF SECTION



## SECTION 260526 GROUNDING AND BONDING

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of grounding work is indicated by Drawings. Types of grounding specified in this section include solid grounding.
- B. Applications of grounding work in this section include underground metal water piping, grounding electrodes, building frames, enclosures, equipment, neutrals, raceways, devices, and outlet, junction, and pull boxes.
- C. Requirements of this section apply to electrical grounding work specified elsewhere in these specifications and shown on drawings.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical connectors, terminals, and fittings of types and ratings required and of ancillary grounding materials, including stranded cable, copper braid and bus, and ground rods, whose products have been in satisfactory use in similar service for not less than three years.
- B. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to electrical grounding and bonding and provide products and components that have been listed and labeled by an NRTL such as UL or equal. Comply with requirements of UL Standards Nos. 467 and 869 pertaining to electrical grounding and bonding.
- C. IEEE Compliance: Comply with requirements of IEEE Standards 80, 81, 141, and 142 pertaining to electrical grounding.
- D. California Electrical Code (CEC) Compliance: Comply with CEC requirements as to materials and installation of electrical grounding systems, associated equipment, and wiring.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data on grounding systems and accessories. Submit installation instructions from the manufacturer of the exothermically welded connections.

## PART 2- MATERIALS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering grounding products that may be incorporated in the work include, but are not limited to, Burndy Corp., General Electrical Supply Co., Ideal Industries, Inc., Thomas and Betts Corp., and O-Z Gedney Div; General Signal Corp.

### 2.02 GROUNDING SYSTEMS

- A. General: Except as otherwise indicated, provide electrical grounding systems indicated, with assembly of materials including, but not limited to, cables/wires, connectors, terminals (solderless lugs), grounding buses in distribution equipment and panelboards, and additional accessories needed for complete installation. Where more than one type unit meets indicated requirements, selection is Installer's option. Where materials or components are not indicated, provide products complying with CEC, IEEE, and established industry standards for applications indicated.
- B. Conductors: Unless otherwise indicated, provide electrical grounding conductors for grounding connections matching power supply wiring materials and sized according to CEC.
- C. Bonding Jumper Braid: Copper braided tape, constructed of 30-gage bare copper wires and properly sized for indicated applications.
- D. Flexible Jumper Strap: Flexible flat conductor, 480 strands of 30-gage bare copper wire; 3/4" wide, 9-1/2" long; 48,250 cm. Select braid with holes sized for 3/8" diameter bolts, and protect braid with copper bolt hole ends.
- E. Grounding Rod Electrodes: Steel with copper clad welded exterior, 5/8" diameter x 10'.
- F. UFER Grounds: Bare stranded copper conductor of AWG and minimum lengths indicated, encased within footings and foundations three inches above bottom. Grounding conductor electrodes shall be exothermically welded together and to ground rod.
- G. Ground Clamps: Cast bronze, suitable for direct burial and wet locations.
- H. Electrical Grounding Connection Accessories: Provide electrical insulating tape, heat-shrinkable insulating tubing, welding materials, and bonding straps, as recommended by accessories manufacturers for type of service indicated.
- I. Field Welding: Comply with AWS Code for procedures, appearance, and quality of welds and for methods used in correcting welding work. Provide welded

connections where grounding conductors connect to underground grounding rods/electrodes, unless otherwise noted.

## PART 3- EXECUTION

### 3.01 INSTALLATION OF ELECTRICAL GROUNDING

- A. General: Install electrical grounding systems where shown, in accordance with applicable portions of CEC and NECA's "Standard of Installation", and with recognized industry practices to ensure that products comply with requirements.
- B. Coordinate with other electrical work as necessary to interface installation of electrical grounding and bonding system work with other work. Install clamp-on connectors only on thoroughly cleaned metal contact surfaces, to ensure electrical conductivity and circuit integrity.
- C. Ground electrical service system neutral at new service and to grounding electrodes.
- D. Raceway grounding: Provide code size insulated equipment grounding conductor in all raceways. All concrete duct banks shall include a 4/0 bare copper equipment ground conductor buried in the concrete.
- E. Connect and bond equipment ground bus, panelboard, exposed non-current-carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, receptacle ground connectors, and piping systems.
- F. Grounding electrode connections shall be exothermically welded, unless otherwise noted.
- G. Tighten grounding and bonding connectors and terminals, including screws and bolts, according to manufacturers' published torque tightening values for connectors and bolts. Where manufacturer's torquing requirements are not indicated, tighten connections to comply with tightening torque values specified in UL 486A to assure permanent and effective grounding.

### 3.02 FIELD QUALITY CONTROL

- A. Upon completion of installation of each electrical system ground, test ground resistance with ground resistance tester. Measure ground resistance not less than two full days after the last trace of precipitation, and without the soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests, by the fall-of-potential method according to IEEE 81. Where tests show resistance to ground is over 5 ohms, take appropriate action, at no additional costs to, to reduce resistance to 5 ohms or less, by driving

additional ground rods and/or by chemically treating soil encircling ground rod;  
then retest to demonstrate compliance.

END OF SECTION

## SECTION 260529 SUPPORTING DEVICES

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of supports, anchors, sleeves, and seals is indicated by Drawings and schedules and/or specified in other Division 26 sections.
- B. Types of supports, anchors, sleeves, and seals specified in this Section include clevis hangers, c-clamps, channel supports, one-hole conduit straps, two-hole conduit straps, round steel rods, and expansion anchors.
- C. Supports, anchors, sleeves, and seals furnished as part of factory fabricated equipment are specified as part of equipment assembly in other Division 26 sections and/or on the Drawings.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of supports, anchors, sleeves, firestopping, and seals of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than three years.
- B. California Electrical Code (CEC) and OSHPD Compliance: Comply with CEC and OSHPD as to construction and installation of electrical supporting devices.
- C. ANSI/NEMA Compliance: Comply with requirements of ANSI/NEMA Standard Publication No. FB 1, "Fittings and Supports for Conduit and Cable Assemblies".
- D. MSS Compliance: Comply with MSS standard requirements pertaining to fabrication and installation practices for pipe hangers and supports and with the seismic requirements of OSHPD.
- E. NECA Compliance: Comply with National Electrical Contractors Association's "Standard of Installation" pertaining to anchors, fasteners, hangers, supports, and equipment mounting.
- F. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to electrical supporting devices and provide products and components that have been listed and labeled by an NRTL such as UL or equal.

#### 1.03 SUBMITTALS

- A. Product Data: Submit catalog cuts, specifications, installation instructions for each type of support, anchor, sleeve, firestopping, and seal.

## PART 2- MATERIALS

### 2.01 MANUFACTURED SUPPORTING DEVICES

- A. Provide supports, anchors, sleeves, and seals complying with manufacturer's standard materials, design, and construction, in accordance with published product information, and as required for a complete installation and as herein specified. Where more than one type of approved device meets indicated requirements, selection is Installer's option.

### 2.02 SUPPORTS

- A. Provide supporting devices of types, sizes, and materials indicated and having the construction features indicated.
- B. Clevis Hangers: For supporting 2" rigid metal conduit, galvanized steel, with 1/2" diameter hole for round steel rod, approximately 54 lbs. per 100 units.
- C. Reducing Couplings: Steel rod reducing coupling, 1/2" x 5/8", black steel, approximately 16 lbs. per 100 units.
- D. C-Clamps: Black malleable iron, 1/2" rod size, approximately 70 lbs. per 100 units.
- E. One-Hole Conduit Straps: For supporting 3/4" rigid metal conduit, one-hole malleable iron with clamp back, approximately 19 lbs. per 100 units.
- F. Two-Hole Conduit Straps: For supporting 3/4" rigid metal conduit, galvanized steel, 3/4" strap width, and 2-1/8" between center of screw holes.
- G. Hexagon Nuts: For 1/2" rod size, galvanized steel, approximately 4 lbs. per 100 units.
- H. Round Steel Rod: Black steel, 1/2" diameter, approximately 67 lbs. per 100 feet.
- I. Offset Conduit Clamps: For supporting 2" rigid metal conduit, black steel, approximately 200 lbs. per 100 units.

### 2.03 ANCHORS

- A. Concrete [and masonry] expansion type anchors shall be equal to Hilti KWIK BOLT TZ2 Wedge anchors.] Allowable shear and tension values in pounds for each anchor shall comply with latest issue of ICC-ES Report No. ESR-4266 and ICC-ES Report No. 4561 respectively. Provide anchors of diameter and minimum embedment as required by loads. Provide carbon steel anchors in dry locations. Provide stainless steel anchors in damp and wet locations.

- B. Expansion type anchors shall be proof load tested per requirements of the State of California.

#### 2.04 U-CHANNEL STRUT SYSTEMS

- A. Provide U-Channel seismic restraint strut system for supporting electrical equipment and for fabricating conduit support trapezes. The channels shall consist of steel strips cold formed to size with a continuous slot on one side and inturred clamping ridges on each side. The slot acts as a guide for attachment nuts. Provide all fittings that mate and match with the U-channel. Fittings shall have same finish as required for channels.
- B. The channels shall be hot dipped galvanized, primed, and finish painted to match adjacent surfaces.

#### 2.05 PIPE SLEEVES

- A. Sheet metal pipe sleeves: Fabricate from galvanized sheet metal, round tube closed with snaplock joint, welded spiral seams, or welded longitudinal joint. Fabricate from the following gages: 3" and smaller, 20 gage; 4" to 6", 16 gage; over 6", 14 gage.
- B. Steel pipe sleeves: Fabricate from Schedule 40 galvanized steel pipe. Remove burrs.
- C. Iron pipe sleeves: Fabricate from cast iron or ductile iron pipe. Remove burrs.
- D. Plastic pipe sleeves: Fabricate from Schedule 80 PVC plastic pipe. Remove burrs.

### PART 3- EXECUTION

#### 3.01 INSTALLATION OF SUPPORTING DEVICES

- A. Install hangers, supports, anchors, sleeves, firestopping, and seals as indicated in accordance with manufacturer's written instructions, recognized industry practices, and details on Drawings, to ensure supporting devices comply with requirements. Comply with NECA, CEC, NFPA, ANSI/NEMA and with requirements of OSHPD and State Fire Marshal for installation.
- B. Coordinate with other electrical work, including raceway and wiring work as necessary to interface installation of supports, anchors, sleeves, firestopping, and seals with other work.
- C. Minimum center to center spacing and edge distance of anchor bolts shall not exceed manufacturer's specifications.

- D. Conduit supports for a single conduit mounted to a surface shall be one-hole malleable iron straps or two-hole steel straps.
- E. All field cut ends of U-channels shall be treated to maintain the same coating protection as the factory supplied channel.

END OF SECTION



## SECTION 260533 RACEWAYS

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of raceways work is indicated by Drawings and schedules.
- B. Types of raceways in this section include rigid metal conduit, rigid nonmetallic conduit, electrical metallic tubing, liquidtight flexible metal conduit, and associated fittings.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of raceway systems of types and sizes required, whose products have been in satisfactory use in similar service for not less than five years.
- B. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to electrical raceway systems and provide products and components that have been listed and labeled by an NRTL such as UL or equal.
- C. NEMA Compliance: Comply with applicable requirements of NEMA standards pertaining to raceways.
- D. California Electrical Code (CEC) Compliance: Comply with requirements as applicable to construction and installation of raceway systems.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data including applicable specifications, installation instructions, fittings, accessories, and general recommendations for each type of raceway.

### PART 2- MATERIALS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Rigid Metal Conduit: Allied Tube and Conduit, Protective Coating Developments, Robroy Industries, Western Tube and Conduit.
- B. Rigid Nonmetallic Conduit and Fittings: Allied Tube and Conduit, Cantex.
- C. Liquidtight Flexible Metal Conduit: AlfLEX, Anamet Electrical.

- D. Metallic Conduit Fittings: Appleton, Bridgeport, Crouse-Hinds, Raco, Thomas and Betts.
- E. Manufacturers offering products that are not named in this section, may be incorporated into the Work, subject to compliance with the requirements of this section.

## 2.02 RIGID METAL CONDUIT AND FITTINGS

- A. Rigid Steel Conduit: Rigid steel conduit shall be hot dip galvanized steel manufactured in accordance with UL Safety Standard #6 and ANSI C80.1.
- B. PVC Coated Rigid Steel Conduit: PVC coated rigid steel conduit shall be hot dip galvanized in accordance with UL Safety Standard #6 and ANSI C80.1. Conduit shall have a 40-mil PVC exterior coating bonded to the galvanized surface and a urethane interior coating.
- C. Fittings: All locknuts shall be galvanized or zinc plated steel. Fittings shall be threaded. Insulating bushings shall be high impact thermoplastic. Fittings used outdoors or in other wet locations shall be NRTL listed for wet location. Fittings for burial in concrete shall be NRTL listed as concretetight. Fittings used with PVC coated rigid steel conduit shall have a 40 mil PVC exterior coating bonded to the galvanized surface and a urethane interior coating. All PVC coated rigid steel condulets and fittings shall be supplied with stainless steel screws.

## 2.03 RIGID NONMETALLIC CONDUIT AND FITTINGS

- A. Rigid Nonmetallic Conduit Schedule 40: Rigid nonmetallic conduit shall comply with NEMA Standards Pub. No. TC2, Type 3, Schedule 40 PVC, for direct burial.
- B. Fittings: Fittings used with rigid nonmetallic conduit shall comply with NEMA Standards Pub No. TC3. Fittings shall match conduit type and material. Adhesive shall be as recommended by the conduit manufacturer.

## 2.04 LIQUIDTIGHT FLEXIBLE METAL CONDUIT AND FITTINGS

- A. Liquidtight Flexible Steel Conduit: Liquidtight flexible steel conduit shall be constructed of single strip, flexible, continuous, interlocked, and double-wrapped steel galvanized inside and outside. Coat with liquidtight jacket of flexible thermoplastic. Conduit shall include a copper equipment ground conductor in sizes through 1-1/4" trade size. Aluminum conduit shall not be used.
- B. Fittings: Provide galvanized fittings that are NRTL approved for grounding. Angle connectors shall be accessible. All fittings shall be watertight.

## PART 3- EXECUTION

### 3.01 GENERAL

- A. Install electrical raceways where indicated, in compliance with this specification and according to manufacturer's written instructions and recognized industry practices.
- B. Coordinate installation of electrical raceways with other work, including metal and concrete deck work, as necessary for proper interface.
- C. Complete installation of electrical raceways before starting installation of cables/conductors within raceways. All raceway fittings shall be made up tight.
- D. Keep interior of conduit clean and clear. Keep ends of all conduits closed during installation, to exclude water and foreign materials. Cap and seal all conduit stub-outs.
- E. Cut ends of conduits square and ream to remove any burrs and sharp edges. Provide conduit terminations at cabinets and boxes with locknuts and bushings as required. Locknuts shall be installed so that the convex side is against the box. Provide watertight conduit hubs on each entry into top of electrical equipment where area is protected by fire sprinklers or where equipment is installed in wet locations.
- F. Provide junction or pull boxes where required for pulling conductors due to excessive number of bends or length of conduit runs.
- G. Re-route conduit where necessary to clear structural and mechanical obstructions. All rerouting shall be approved by the Engineer.
- H. Provide polyethylene pullrope, minimum 1/8" diameter, in all empty conduits. Pullrope shall have minimum 200 lbs. tensile strength. Leave minimum 36" of slack at each end of pullrope.
- I. Field bends in conduit shall be smooth and shall not materially reduce the internal diameter of the conduit. Bends shall not be made at joints. In no case shall radii be less than required by applicable codes. All underground bends shall be made with as large a radius as possible to facilitate pulling of conductors.
- J. Orient all raceways to maintain accessibility to conduit bodies, junction boxes, pull boxes, and outlet boxes.
- K. Install exposed and concealed conduit to maintain 6" clearance from parallel runs of fluid filled piping, steam piping, and ductwork.

- L. Provide insulated bushings or insulated throat connectors for terminations at all boxes and cabinets including any underground conduits for installation of utility conductors.
- M. Provide expansion fittings or flexible conduit wherever conduits cross building separations, expansion joints, and seismic separations. Expansion provisions shall allow for twice the expansion and relative drift of the building elements.

### 3.02 WIRING METHOD

- A. Rigid steel conduit: Install rigid steel conduit embedded in concrete, where subject to mechanical damage, or where exposed.
- B. PVC coated rigid steel conduit: Install PVC coated rigid steel conduit underground, where in direct contact with earth, and where indicated on the Drawings. All penetrations through concrete walls in damp or wet locations shall be made with PVC coated rigid steel conduit.
- C. Rigid nonmetallic conduit: Rigid nonmetallic conduit may be used in lieu of PVC coated rigid steel conduit when installed underground or under slabs in contact with earth. Rigid nonmetallic conduit shall not be used for conduits containing branch circuit conductors. All vertical elbows and risers in rigid nonmetallic conduit runs shall be PVC coated rigid galvanized steel conduit.
- D. Liquidtight flexible steel conduit: Install liquidtight flexible steel conduit and fittings in damp locations, wet locations, or where subjected to dripping oil for final connection to motors or other vibrating equipment and where indicated on the Drawings. It may also be used in other locations where, due to structural conditions, rigid steel conduit cannot be used. This use will be allowed only if approved by the Engineer.

### 3.03 EXPOSED INSTALLATIONS

- A. Secure conduit runs with one-hole malleable iron or two-hole galvanized clamp type straps. Where several conduits are run together or where conduits are suspended, hang them on metal framing systems.
- B. Run exposed conduit at right angles or parallel to structural members, walls, floor, and ceiling.
- C. Prime and finish paint all exposed conduits to match adjacent surfaces.

### 3.04 UNDERGROUND INSTALLATIONS

- A. Bury underground conduits containing maximum 600 volt conductor insulation a minimum depth of 24" from surface of finished grade to the top surface of the conduit. Where they run under roadways or parking areas, depth shall be 30"

minimum from finished grade. Coordinate all new underground installations with existing and new piping systems and utilities.

- B. Minimum underground conduit size shall be 3/4" trade size. Underground conduit runs larger than 1" trade size, in non-traffic areas, shall be buried to a minimum depth of 12" below slab. Where underground conduits rise through finished grade the curved portion of bends shall not be visible.
- C. Underground conduits smaller than 3" trade size shall be cleaned by pulling a wire brush and swab through each conduit until conduit is clear of all particles including earth, sand, and gravel.
- D. Provide underground conduit stubouts with a flush concrete marker within the last 2' of the stubout. Use a 3" cardboard tube for a form, allowing the concrete to spread out around the conduit. Embed a brass marker in the face of concrete marker, indicating the size, usage, and number of stubouts. Where the stubouts do not extend more than 5' beyond a building wall, the marker may be secured to the wall directly above the stubout.
- E. All conduit runs installed underground shall be encased all around in minimum of 3" of concrete unless otherwise noted. Where PVC coated rigid steel conduit is used, concrete encasement shall not be required.
- F. Where other utility piping systems are encountered or being installed along a raceway route, maintain a 12-inch-minimum vertical separation between raceway and other systems at crossings. Maintain a 12-inch-minimum separation between raceways and other systems in parallel runs. Do not place raceways over valves or couplings in other piping systems. Refer conflicts with these requirements to the Engineer for instructions before further work is done.
- G. Trenching and backfill for underground or buried conduit or cable shall be provided as part of the work of this section of the specifications. Trenching and backfill and testing and inspection of trenching and backfill for underground buried conduit or cable shall be performed as specified in Section 312316 - Trenching, Backfilling, and Compacting.
- H. Concrete encased individual conduits and multiple conduits in the same trench (duct banks) shall comply with the following:
  - 1. Conduits shall be installed on a grade line of two inches fall per 100 feet, sloping away from buildings and toward a manhole or pull box.
  - 2. Concrete for conduit encasement shall be 3000 psi. The top three (3) inches of envelope shall be colored red with red iron oxide pigment that is integrally mixed with the concrete in the proportion of two pounds per sack of cement. Pigment shall be shall be commercially pure hydrated oxide, insoluble in water, free from soluble salts and acids, with calcium sulfate less than 10%. Pigment shall be fortified with a plasticizing agent that is compatible with type II portland cement. Pigment shall be dry batched with

- the aggregate. For additional requirements, refer to Section 030500 and 033000.
3. Separation of conduits shall be maintained by installing plastic spacers that interlock horizontally and vertically. Spacers shall be installed to provide a completely enclosed and supported conduit assembly every eight feet with hold down anchors installed between each spacer. Include spacers between earth and the bottom duct row to maintain concrete encasement around the conduits. Stagger the joints of the conduits by rows and layers.
  4. All conduits containing power cables shall be arranged so that exterior surface of every conduit is within 3 inches of earth in at least one quadrant.

END OF SECTION

## SECTION 260534 ELECTRICAL BOXES

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of electrical box work is indicated by Drawings and as specified herein.
- B. Types of electrical boxes in this Section include outlet boxes, junction boxes, pull boxes, and conduit bodies.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical boxes of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than three years.
- B. California Electrical Code (CEC) Compliance: Comply with CEC as applicable to construction and installation of electrical wiring boxes.
- C. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to electrical boxes and provide products and components that have been listed and labeled by an NRTL such as UL or equal.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data on pull boxes, junction boxes, outlet boxes, and conduit bodies. Identify proposed equipment by manufacturer's catalog numbers.

### PART 2- MATERIALS

#### 2.01 OUTLET BOXES

- A. Provide corrosion-resistant cast iron outlet boxes of types, number of gangs, shapes, and sizes including depth of boxes, to suit each respective location and installation. Construct with threaded rigid hubs of the quantity and size required at each location, and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices. Exposed outlet boxes in damp or wet locations shall be provided with cast metal faceplates with spring hinged waterproof caps suitably configured for each application and device installed, including faceplate gaskets and corrosion-resistant fasteners.
- B. Provide boxes of proper code size for the number of and types of devices installed and number and AWG of wires passing through or terminating therein,

but in no case less than 4-9/32" high by 2-3/4" wide by 2-5/8" deep, unless specifically noted as smaller on the Drawings.

- C. Exposed Outlet Box Accessories: Provide outlet box accessories as required for each installation that are compatible with outlet boxes being used and fulfilling requirements of individual wiring situations. Provide cast metal covers either blank or with the proper configuration for the devices installed at each location. Exposed outlet boxes in damp or wet locations shall be provided with cast metal faceplates with covers suitably configured for each application and device installed, including faceplate gaskets and corrosion-resistant fasteners.
- D. Available Manufacturers: Subject to compliance with requirements, manufacturers offering cast metal outlet boxes that may be incorporated in the work include, but are not limited to Appleton Electric Co., Bell Electric Co., Crouse Hinds Co., O-Z/Gedney, or equal.

## 2.02 JUNCTION AND PULL BOXES

- A. Provide galvanized code gage sheet steel junction and pull boxes, with screw-on covers, of types, shapes, and sizes to suit each respective location and installation, with welded seams and equipped with stainless steel nuts, bolts, screws, and washers. Furnish in prime coat. Finish paint all exposed junction and pull boxes to match adjacent surfaces. Provide screw fastened engraved nameplate on each pull box and junction box identified with a specific name on the Drawings.
- B. Available Manufacturers: Subject to compliance with requirements, manufacturers offering junction and pull boxes that may be incorporated in the work include, but are not limited to, Circle A-W, Cross, Hammond, or equal.

## 2.03 CONDUIT BODIES

- A. Provide galvanized cast metal conduit bodies of types, shapes, and sizes to suit respective locations and installation, constructed with threaded conduit entrance hubs, removable covers, and corrosion-resistant screws. Covers shall be gasketed Form 8 style.
- B. All conduit bodies shall be identified as complying with the dimensions required in CEC Article 314.28(A)(2). Smaller conduit bodies with marking indicating the maximum size and quantity of conductors shall not be used as an alternate means of complying with this requirement.
- C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering conduit bodies that may be incorporated in the work include Appleton Electric Co., Crouse-Hinds Co., Killark Electric Mfg. Co., O-Z/Gedney Co., Pyle-National Co., or equal.



## 2.04 KNOCKOUT CLOSURES

- A. Provide corrosion-resistant punched steel box knockout closures of types and sizes to effectively close openings in the box.

## PART 3- EXECUTION

### 3.01 INSTALLATION OF ELECTRICAL BOXES

- A. General: Install electrical boxes where indicated, complying with manufacturer's written instructions, with applicable requirements of CEC and NECA's "Standard of Installation," and with recognized industry practices to ensure that products fulfill requirements.
- B. Coordinate installation of electrical boxes with wire/cable and raceway installation work.
- C. Provide weatherproof outlets boxes in all damp and wet locations unless otherwise noted.
- D. Provide gasketed weatherproof covers for concealed boxes in all damp and wet locations unless otherwise noted.
- E. Provide knockout closures to cap unused knockout holes where blanks have been removed.
- F. Install boxes and conduit bodies in those locations that ensure ready accessibility of electrical wiring.
- G. Fasten boxes rigidly to substrates or structural surfaces to which attached, or solidly embed electrical boxes in concrete.
- H. Provide electrical connections for installed boxes.

END OF SECTION

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## SECTION 260535 UNDERGROUND STRUCTURES

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of underground structure work is indicated by Drawings and is hereby defined to include only those used for installation of electrical cables, wires, and equipment.
- B. Types of underground structures in this section include, but are not limited to, handholes.
- C. Excavation and backfilling for underground structures shall comply with Section 312300 Earthwork.
- D. Concrete for underground structures shall comply with the requirements of this Division and with manufacturer's standards for construction of underground structures.
- E. Comply with manufacturer's directions for waterproofing and dampproofing of handholes.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of underground structures of types and sizes required, whose products have been in satisfactory use in similar service for not less than five years.
- B. ANSI Compliance: Comply with requirements of ANSI C2, "National Electrical Safety Code", pertaining to construction and installation of handholes and manholes.
- C. ASTM Compliance: Comply with applicable provisions of American Society for Testing and Materials (ASTM) standards pertaining to construction and materials for vaults, manholes, and handholes.
- D. Nationally Recognized Testing Laboratory (NRTL) Compliance: Provide underground structure accessories that are listed and labeled by an NRTL such as UL.
- E. California Electrical Code (CEC) Compliance: Comply with CEC requirements as applicable to construction and installation of handholes.

### 1.03 SUBMITTALS

- A. **Manufacturer's Data:** Submit manufacturer's data on each underground structure including size, concrete strength, cover style, and cover identification provided for each individual handhole.
- B. **Accessories:** Submit manufacturer's data and installation instructions on each accessory provided with underground structures including cable racks and joint sealing products.
- C. **Shop Drawings:** Submit a scaled drawing for each individual handhole including plans, sections, sump pits, cable racks, pulling irons, ground rods, and H-20 bridge rated watertight covers. The drawings shall include dimensions for knockouts or terminators and location of conduit entries.

### 1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Equip and protect factory-fabricated underground structures to prevent damage, including chipping and cracking during transportation, storage, and handling. Do not install damaged units; replace and remove from project site.

## PART 2- MATERIALS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following: Oldcastle Precast Products, Inc., BES Products, Inc., or equal.

### 2.02 FACTORY-FABRICATED HANDHOLES

- A. Provide traffic rated handholes for pulling, splicing, and terminating conductors, in types and sizes indicated, with watertight bolt down cover and knockout access holes.
- B. Handholes with inside dimensions 17"wide by 30" long shall be provided with a single plate H-20 traffic bridge loading galvanized steel cover. Covers shall be fastened with stainless steel hex head bolts.
- C. Covers for utility company boxes shall comply with the respective utility company requirements. Covers for all other boxes shall be engraved or identified with permanent identification; "ELECTRICAL" for primary and secondary power.

## 2.03 ACCESSORIES

- A. Provide handhole accessories, including pulling-in irons, embedded cable support accessories, cable rack arms, porcelain saddles, sump pump pits, mastics, and sealants. Cable racks shall be hot dip galvanized.

## PART 3- EXECUTION

### 3.01 INSTALLATION OF UNDERGROUND STRUCTURES

- A. Install handholes as indicated, according to manufacturer's written instructions and with recognized industry practices to ensure compliance with requirements.
- B. Place precast concrete sections as indicated. Provide minimum six inches of compacted crushed rock or base sand material under the full bottom dimension of the unit. The top of underground structures shall be set to avoid being above or below finished grades. The units shall be located to avoid the possibility of being located at a low point in the graded area where drain water may flow.
- C. In turfed areas, the top of underground structures shall be adjusted to follow the slope of the terrain and the top shall not be lower than the grade nor protrude more than one inch above the grade. In paved areas, the top shall be adjusted to follow the slope of the grade. It shall be raised approximately half an inch above surrounding grade and the pavement built up even with the top of the unit to allow for drainage. Use epoxy bonding compound where steps are mortared into unit walls.
- D. Coordinate dampproofing and waterproofing work with installation of precast concrete units, as necessary for proper interface. The sections of precast handholes shall be assembled so that the joints shall be watertight. Apply bituminous mastic coating at joints between sections.
- E. Coordinate with other Work, including electrical raceway and wiring Work, as necessary to interface installation of manholes and handholes with other Work.

### 3.02 BACKFILLING

- A. General: Delay backfilling of excavations surrounding handholes and manholes until after initial inspection has been completed. Refer to Section 312316.

END OF SECTION

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## SECTION 260553 BASIC ELECTRICAL IDENTIFICATION

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of electrical identification is indicated by Drawings and schedules and this specification.
- B. Types of electrical identification specified in this section include the following:
  - 1. Electrical power, communications, signal, and alarm conductors.
  - 2. Operational instructions and warnings.
  - 3. Equipment/system identification signs.
  - 4. Conduits, outlets, and boxes.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of electrical identification products of types required, whose products have been in satisfactory use in similar service for not less than three years.
- B. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to electrical identification and provide products and components that have been listed and labeled by an NRTL such as UL or equal. Comply with UL Standard 969, "Marking and Labeling Systems", pertaining to electrical identification systems.
- C. NEMA Compliance: Comply with requirements of NEMA Standards Nos. WC-1 and WC-2 pertaining to identification of power and control conductors.
- D. California Electrical Code (CEC) Compliance: Comply with CEC as to installation of identifying labels and markers for wiring and equipment. Identify all equipment, conduits, outlets, junction boxes, and pull boxes of emergency systems.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data on electrical identification materials and products.

### PART 2- MATERIALS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering electrical identification products that may be incorporated

in the work include W.H. Brady Co., Calpico Inc., Ideal Industries, Inc., National Band and Tag Co., Panduit Corp., Seton Name Plate Co., or equal.

## 2.02 ELECTRICAL IDENTIFICATION MATERIALS

- A. Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than a single type is specified for an application, selection is Installer's option, but provide single selection for each application.
- B. Color-Coded Conduit Markers: Provide manufacturer's standard pre-printed, flexible or semi-rigid, permanent, plastic-sheet conduit markers, extending 350 degrees around conduits, designed for attachment to conduit by adhesive. Except as otherwise indicated, provide lettering that indicates voltage of conductor(s) in conduit. Provide 8" minimum length Unless otherwise indicated or required by governing regulation, provide orange markers with black letters.
- C. Color-Coded Plastic Tape: Provide manufacturer's standard self-adhesive vinyl tape not less than 3 mils thick by 1-1/2" wide. Unless otherwise indicated or required by governing regulations, provide orange tape.
- D. Cable/Conductor Identification Bands: Provide manufacturer's standard vinyl-cloth self-adhesive cable/conductor markers of wrap-around type, either pre-numbered plastic coated type or write-on type with clear plastic self-adhesive cover flap, numbered to show circuit identification.
- E. Engraved Plastic-Laminate Signs: Provide engraving stock melamine plastic laminate, complying with FS L-P-387, in sizes and thicknesses indicated, engraved with engraver's standard letter style of sizes and wording indicated, black face and white core plies (letter color). Provide thickness of 1/16", except as otherwise indicated. Punch plastic laminate for mechanical fastening and provide self-tapping stainless steel screws. Provide contact-type permanent adhesive where screws cannot or should not penetrate substrate.

## 2.03 LETTERING AND GRAPHICS

- A. Coordinate names, abbreviations, and other designations used in electrical identification work with corresponding designations shown, specified, or scheduled. Provide numbers, lettering, and wording as indicated or, if not otherwise indicated, as recommended by manufacturers, or as required for proper identification and operation/maintenance of electrical systems and equipment. Comply with ANSI A13.1 pertaining to minimum sizes for letters and numbers.



## PART 3- EXECUTION

### 3.01 APPLICATION AND INSTALLATION

- A. General Installation Requirements: Install electrical identification products as indicated, in accordance with manufacturer's written instructions and with requirements of CEC. Where identification is to be applied to surfaces that require finish, install identification after completion of painting.
- B. Conduit Identification: Where electrical conduit is exposed in spaces with exposed mechanical piping that is identified by a color-coded method, apply color-coded identification on electrical conduit in a manner similar to piping identification. Except as otherwise indicated, use orange as coded color for conduit.
- C. Cable/Conductor Identification: Apply cable/conductor identification including voltage, phase, and feeder number on each cable and conductor in each box/enclosure/cabinet where wires of more than one lighting or power circuit occur, except where another form of identification (such as color-coded conductors) is provided. Match identification with marking system used in panelboards, shop drawings, contract documents, and similar previously established identification for project electrical work.
- D. Danger Signs: Critical Switches/Controls: Install danger signs on switches and similar controls, regardless of whether concealed or locked up, where untimely or inadvertent operation (by anyone) could result in significant danger to persons or damage to or loss of property.
- E. Equipment/System Identification: Install engraved plastic-laminate sign on each major unit of electrical equipment in building, including central or master unit of each electrical system including communication, signal, and alarm systems, unless unit is specified with its own self-explanatory identification. Except as otherwise indicated, provide single line of text, 1/2" high lettering on 1-1/2" sign (2" high where 2 lines are required), white lettering in black field. Provide text matching terminology and numbering of the contract documents and shop drawings. Install signs at locations indicated or, where not otherwise indicated, at location for greatest convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with fasteners, except use adhesive where fasteners should not or cannot penetrate the substrate. Provide signs for each unit of the following categories of electrical work:
  - 1. Switchboards, panelboards, transformers, electrical power, signal, and control cabinets and enclosures.
  - 2. Disconnect switches, individually mounted circuit breakers.
  - 3. Control relays and starters.

END OF SECTION

## SECTION 260573 ELECTRICAL SYSTEM STUDY

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. An Electrical System Study consisting of short-circuit studies, protective device evaluation studies, protective device coordination studies, and arc flash analysis shall be performed on the new 240/120 volt power distribution system. This study shall be performed by an independent firm specializing in such studies such as Eaton, KSG Consulting Engineers, or as approved by Engineer. The studies shall be submitted with the new emergency distribution circuit breaker shop drawings. The Electrical System Study shall be performed in a timely manner.
- B. The studies shall include all portions of the new electrical distribution system from the Pacific Gas & Electric Co. transformer to the downstream load terminals of all 240 volt branch-circuit overcurrent protective devices.
- C. The Short-circuit Study shall be in accordance with ANSI C37.5 - 1979, IEEE Std. 399 - 1997 and IEEE Std. 141-1993.

#### 1.02 SUBMITTALS

- A. The results of the electrical system study shall be summarized in a final report. An electronic submittal and two (2) hard copies of the final report shall be submitted.
- B. The report shall include the following sections:
  - 1. Description, purpose, basis and scope of the study and a single line diagram of that portion of the Electrical System which is included in the scope of the study.
  - 2. Tabulations of circuit breaker, switch, fuse and other protective device ratings versus calculated short-circuit duties, and commentary regarding same.
  - 3. Protective device time versus current coordination curves, tabulations of relay and circuit breaker trip settings, fuse selection, and commentary regarding same.
  - 4. Fault current calculations including a definition of terms and guide for interpretation of computer printout.
  - 5. Arc flash analysis shall include incident energy levels, protection boundaries, and PPE levels.
  - 6. Provide a sample of the Arc Flash labels in the report to be used for this project.

### 1.03 SHORT CIRCUIT STUDY

- A. The short-circuit study shall be performed with the aid of a computer program.
- B. Obtain from the utility company both the present and anticipated utility data including present and ultimate short-circuit contribution, source impedance, the X/R ratio, and utility transformer capacity, and include this input in the study.
- C. Short-circuit momentary duty values and interrupting duty values shall be calculated on the basis of assumed three-phase bolted short-circuits at switchboards, primary distribution transformer overcurrent protection, and other significant locations through the systems. The short-circuit tabulations shall include symmetrical fault currents and X/R ratios. For each fault location, the total duty on the bus as well as the individual contribution from each connected branch shall be listed with its respective X/R ratio.

### 1.04 PROTECTIVE DEVICE EVALUATION STUDY

- A. A protective device evaluation study shall be performed to determine the adequacy of circuit breakers and fuses by tabulating and comparing the short-circuit ratings of these devices with the calculated fault currents. Appropriate multiplying factors based on system X/R ratios and protective device rating standards shall be applied. Any problem areas or inadequacies in the equipment due to short-circuit currents shall be promptly brought to the Engineer's attention.

### 1.05 PROTECTIVE DEVICE COORDINATION STUDY

- A. A protective device coordination study shall be performed to provide the necessary calculations and logic decisions required to select or to check the selection of power fuse ratings, protective relay characteristics and settings, ratios and characteristics of associated current transformers, and low voltage breaker trip characteristics and settings. The objective of the study is to obtain optimum protective and coordination performance from these devices.
- B. The phase and ground overcurrent and ground fault protection shall be included as well as settings of all other adjustable protective devices.
- C. The time-current characteristics of the specified protective devices shall be drawn on Keuffel and Esser log-log paper. The plots shall include complete titles, representative one-line diagram and legends, relays or fuse characteristics, significant motor starting characteristics, complete parameters of transformers, complete operating bands of low voltage circuit breaker trip curves and fuses. The coordination plots shall indicate the types of protective devices selected, proposed relay taps, time dial and instantaneous trip settings, transformer magnetizing inrush and ANSI transformer withstand parameters, cable thermal overcurrent withstand limits and significant symmetrical and asymmetrical fault currents. All restrictions of the California Electrical Code shall

be adhered to and proper coordination intervals and separation of characteristic curves shall be maintained. The coordination plots for phase and ground protective devices shall be provided on a system basis. A sufficient number of separate curves shall be used to clearly indicate the coordination achieved.

#### 1.06 PROTECTIVE DEVICE TESTING, CALIBRATION, AND ADJUSTMENT

- A. The equipment manufacturer or the independent firm specializing in the calibration and testing shall provide the services of a qualified engineer and necessary tools and equipment to test, calibrate, and adjust all new and modified existing ground fault settings and circuit breaker trip devices as recommended in the electrical system studies.

#### 1.07 ARC FLASH ANALYSIS

- A. Provide an Arc Flash analysis to identify protection boundaries, incident energy levels (IE) and personal protective equipment (PPE) to be worn by maintenance personnel when working on energized equipment.
- B. The analysis shall be based on the calculation methods and recommendations in NFPA 70E, Standard for Electrical Safety in the Workplace, 2009 Edition. Provide calculations utilizing software as provided by ETAP or SKM. The electrical system shall be modeled to include the utility incoming utility service, utility transformer, motor control boards, motors, circuit breakers, auxiliary equipment, stepdown transformers and wiring between electrical components. Completion of the coordination study is required prior to performing the flash analysis.
- C. Using the selected protective device settings, provide analysis of alternative scenarios to determine the worst case incident energy levels and select appropriate PPE levels. The scenarios shall include but not limited to: (1) maximum available short-circuit current available from the utility; and (2) minimum short-circuit current available from the utility.
- D. The Arc Flash analysis shall be provided in a report format which includes the one line diagram, coordination curves, selected protective device settings, available short-circuit currents, documentation of input characteristics for the electrical system, incident energy levels, protection boundaries and PPE levels.
- E. After review and acceptance of the Arc Flash analysis by the Engineer, Contractor shall provide and install Arc Flash labels on the equipment.
- F. The study shall be signed and stamped by an electrical engineer registered in the State of California.

PART 2- NOT USED

PART 3- NOT USED

END OF SECTION

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## SECTION 262419 MOTOR CONTROL CENTERS

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of alternating current motor control center equipment is indicated by Drawings, schedules, and schematic diagrams.
- B. Types of motor control equipment specified in this Section include grouped motor controls in a motor control center including supporting structures, bus systems, starter units, controllers, disconnects, overload protection, panelboard, automatic transfer switch, and motor control accessories.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of motor control centers of types, sizes, and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. Installer: Qualified with at least three years of successful installation experience on projects with electrical installation work similar to that required for Project.
- C. NEMA Compliance: Comply with NEMA Standard Publication No. ICS 2, pertaining to construction, testing, and installation of motor control equipment and with applicable NEMA standards for circuit breakers and fuses.
- D. California Electrical Code (CEC) Compliance: Comply with requirements of CEC as applicable to motor control equipment and ancillary equipment.
- E. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to motor control equipment and provide products and components that have been listed and labeled by an NRTL such as UL or equal. Comply with requirements of UL 845, "Electric Motor Control Centers."
- F. IEEE Compliance: Comply with requirements of IEEE Standard 241 pertaining to construction and installation of motor control equipment.
- G. ANSI Compliance: Comply with requirements of ANSI as applicable to motor control equipment.

#### 1.03 SUBMITTALS

- A. Product Data: For individual motor controllers, submit manufacturer's technical product and application data including, but not be limited to, voltage, phase, frequency, short circuit rating, motor circuit protectors and short-circuit

protection, type of motor starting, full voltage non-reversing starter, including all accessories, electronic overload relay, type of wiring, and enclosures. Submit horizontal bus capacity, vertical bus capacity, short circuit rating, main and branch circuit breakers, bus bracing levels, and motor control center enclosure type. Submit certification that the motor control center has been tested for use in Seismic Zone 4 locations.

- B. Shop Drawings: Submit shop drawings including complete control diagram with terminal numbers and wire designations indicated for motor controllers. Control diagrams shall identify remote field wiring, annotated with the identification tag numbers for the field devices installed under this project. Control diagrams shall also include a cross reference to the product data for each accessory. Submit layout drawings of motor starters showing accurately scaled equipment locations. Submit dimensioned drawings of motor control centers showing accurately scaled basic sections including auxiliary compartments, tops hats, section components, copper ground buses, multi-conductor lugs, special provisions for multiple conduit entries or feeder bus duct entry, bus interfacing sections, pull sections, bus transition sections, and all accessories as indicated and required.
- C. Operation and Maintenance Manuals: Submit manufacturer's printed instruction information, recommended renewal parts list, insulation resistance measurements, and include information required in 1.03A and 1.03B. Indicate exact model number and rating for as installed overload elements

## PART 2- MATERIALS

### 2.01 ACCEPTABLE MANUFACTURERS

- A. Subject to compliance with requirements, manufacturers offering motor control centers that may be incorporated in the Work include, but are not limited to, Eaton, Rockwell Automation, General Electric Co., Square D Co.

### 2.02 GENERAL

- A. Motor control center assembly shall consist of one or more stationary free-standing, totally enclosed NEMA 3R non-walk-in structures, each with a grouping of units containing combination molded case circuit breakers, full voltage non-reversing starters, including other accessories and devices as relays, time delay relays, time switches, selector switches, as required for the control of motors. The control centers shall be NEMA Class II, Type B, plug-in, designed, manufactured, and tested to meet the latest IEEE and NEMA standards.
- B. Two horizontal wiring spaces shall be provided, one at the top and the other at the bottom, which shall line up with adjacent units to form a convenient raceway the entire width of the control center. A vertical wiring compartment shall be



provided for each structure for unit wiring. The vertical space shall be equipped with cable tie supports to hold cable and wiring in place.

- C. Each unit compartment shall be provided with an individual front door and shall be interlocked with the unit disconnect device to prevent unintentional opening of the door with the power on and unintentional application of power while door is open. All units shall be plug-in, lock-out type with guide rails for supporting and aligning the unit starter during removal or replacement. Each unit shall have provisions for padlocking the disconnect device in the "OFF" position. Each compartment shall be effectively baffled and properly ventilated. All doors shall have formed round corners proper for retaining neoprene gaskets and shall be held closed by quick captive fasteners and shall be part of the structure. A wiring diagram holder shall be provided on the inside of each door.
- D. The main horizontal bus and vertical buses shall be tin-plated copper and be rated as indicated on the Drawings and shall be provided across the top of the structure. Bus shall be supported by means of bus supports. Each structure shall be complete with vertical copper bus risers to distribute incoming power to all compartments including spaces.
- E. Feeder circuit breakers in motor control centers shall be molded case circuit breakers of the sizes indicated on the Drawings.
- F. The motor control centers shall be complete with conventional track mounted terminals mounted on lift-out brackets in the unit. Interwiring between units by Work of this Section shall be rated for 240 volts, 60-cycles, 3-phase,-wire, AC supply. All circuit breakers, starters and component parts, including required bracing of the motor control center, shall be rated to withstand a minimum short circuit current of 25,000 amps RMS. See single line diagram, MCC control diagrams, and Drawings for requirements and location of motor control centers.
- G. Motor control center and each circuit shall have an engraved laminated plastic nameplate fastened with stainless steel screws. Each circuit nameplate shall include the circuit designation, equipment controlled, and the horsepower of the motor connected. Provide similar engraved nameplate identifying motor control center and voltage. Provide white letters on red background.
- H. The motor control center shall include a full height un-bussed section with a back panel dedicated for instrumentation equipment and wiring.

## 2.03 ENCLOSURE

- A. Provide NEMA 3R non-walk in enclosure. Certify the enclosure to meet all applicable seismic requirements of the California Building Code for Seismic Zone 4 application. Submit guidelines for the installation consistent with these requirements prepared by the motor control center manufacturer and based upon testing of representative equipment.

- B. Enclosures and Mounting: Enclosures shall be fabricated of cold rolled steel on a structural shape or formed steel frame and ends shall be mounted on continuous channel iron sills closed on the ends. Mounting channels shall have holes provided with maximum diameter 1/8" larger than anchor bolts. All parts and materials shall be furnished by the motor control center assembler. Complete assembly shall be have a short circuit current withstand rating of 50,000A. Enclosure shall be housed in a flat top NEMA 3R enclosure. The enclosure shall be treated with a phosphate pretreatment and painted in ANSI #49 medium light gray baked enamel. Supply enclosure with one can of matching aerosol spray paint for touchup after installation.
- C. Equip with factory-installed thermostatically controlled 150 watt electric space heaters in each vertical section to maintain enclosure temperature above expected dew point. Power source shall be 120 volt.

#### 2.04 FULL VOLTAGE NON-REVERSING STARTER

- A. Magnetic starters shall be combination magnetic circuit breaker type, full voltage, single speed non-reversing as indicated.
- B. Solid State Overload Relay: Provide a definite-purpose, microprocessor-based overload relay in the starter for protection, control and monitoring of the motor. The relay shall not require external current transformers for applications up to 150 amperes for motors rated less than 600 Vac. The relay shall include terminals for remote trip and remote reset. The relay shall include the following additional features:
  - 1. Provide unit with fault relay, Form A, NO contact, ground fault relay, Form A, NO contact, external remote reset terminal, and trip status indicator.
  - 2. The relay shall annunciate motor protection consisting of thermal overload, jam protection, current unbalance, current phase loss, ground fault, and phase reversal. Annunciation shall include load protection for undercurrent, low power and high power. In addition, provide annunciation for line protection including overvoltage, under voltage, voltage unbalance, and voltage phase unbalance.
  - 3. The relay shall monitor the average and phase RMS current and voltage, the motor kW, power factor, frequency, thermal capacity, run hours, ground fault current, current unbalance, and voltage unbalance
- C. Controller enclosure shall be provided with an individual front door and shall be interlocked with the unit disconnect device to prevent unintentional opening of the door with the power on and unintentional application of power while door is open.
- D. Each controller shall have an engraved laminated plastic nameplate with the circuit designation, equipment controlled, and the horsepower of the motor

connected. Nameplate shall be fastened with stainless steel screws. Provide black letters on white background.

- E. The short-circuit protection shall be plastic molded case, magnetic only instantaneous trip motor circuit protector type for use in combination with motor contactor and overload relay. Breaker contact shall be a non-weldable silver alloy. Breaker shall have arc extinguishing chutes. Each motor circuit protector shall be provided with a minimum of two auxiliary relay contacts for disconnecting external voltages within the starter when the motor circuit protector is in the off position. The operating handle shall clearly indicate whether the breaker is "ON," "OFF," or "TRIPPED." The circuit breakers shall be rated to withstand a minimum 22,000 amps symmetrical short circuit current unless otherwise noted on the Drawings.

## 2.05 CIRCUIT BREAKERS

- A. Circuit breakers: New molded case thermal magnetic circuit breakers shall have toggle handles that indicate when breaker is tripped. Multiple pole breakers shall have common trip so overload on one pole will trip all poles simultaneously. Provide padlockable lock-offs on each new circuit breaker. Circuit breakers shall be automatic with an interrupter and trip element for each pole, all enclosed in a molded plastic case. The operating mechanism shall provide quick-make, quick-break, trip free contact action. The operating handle of the circuit breaker shall open and close all poles of a multi-pole breaker simultaneously. Each breaker shall have a thermal magnetic trip unit for each pole, consisting of a thermal element for time-delayed overload protection and a magnetic element for short circuit protection. Individual single pole breakers with tie bars will not be acceptable. The breakers shall have a visible trip indication. Units shall be of the size shown on the Drawings and shall meet NEMA and/or UL specifications.

## 2.06 PANELBOARD

- A. Provide new panelboard, enclosure, and ancillary components of types, sizes, and ratings indicated, which comply with manufacturer's standard materials, design, and construction according to published product information. Equip with number of unit panelboard devices as required for complete installation.
- B. Panelboard shall be deadfront with switching and protective devices in quantities, ratings, types, and arrangements shown, with anti-burn solderless pressure type lug connectors approved for copper conductors. Equip with copper bus bars, full-sized neutral bar, with bolt-in type heavy duty, quick make, quick break, circuit breakers as indicated on schedules. Provide suitable lugs on neutral bus for each outgoing feeder required. Provide bare copper uninsulated grounding bar suitable for bolting to enclosure. Circuit breakers shall be thermomagnetic with minimum AIC as indicated on the Drawings. Circuit breakers serving mechanical equipment shall be HACR rated. Branch circuits

feeding motors, appliances, and signal and control systems shall have provisions for padlocking the breaker in the open or closed position.

- C. Provide galvanized sheet steel cabinet type enclosures, in sizes and NEMA types indicated, code gauge, minimum 16 gauge thickness. Construct with blank endplates and wiring gutters. The wiring gutters shall be sufficient to accommodate the conductor sizes shown on the Drawings. Panelboard shall be equipped with interior circuit directory containing neatly typewritten schedule and mounted on the inside of the door. Provide baked gray enamel finish over a rust inhibitor. Provide enclosures fabricated by same manufacturer as panelboard, which mate properly with panelboard to be enclosed.

## 2.07 ACCESSORIES

- A. All selector switches and pilot lights shall be door mounted unless otherwise noted on the Drawings. Selector switches shall be rated 10 amperes at 600 volts, be heavy-duty, oil-tight, and have the number of positions and poles indicated. Each shall have a factory-engraved legend plate, as shown on the Drawings.
- B. Control relays shall be machine tool type with 115 volt AC coils. Relays shall be equipped with 1 normally open and 1 normally closed contact in addition to those required by the Drawings. Contacts shall be field convertible.
- C. Indicating lights shall be full voltage LED, push-to-test type, heavy-duty and oil-tight as specified above for selector switches. Each indicating light shall be nickel-plated with screwed-on glass prismatic lens approximately one inch in diameter. Lens color shall be as indicated on the drawings.
- D. Time delay relays shall be synchronous motor driven (on delay) or pneumatic (off delay). Relay coils shall be 115 volt AC with 5 ampere contacts at 120 volts.
- E. Current transformers and ammeters shall be provided for units indicated. Ammeter range shall be 150% of motor running amperes to nearest standard range.

## PART 3- EXECUTION

### 3.01 INSTALLATION OF MOTOR CONTROL CENTERS

- A. Install motor control centers as indicated, according to equipment manufacturer's written instructions and with recognized industry practices to ensure that motor control centers comply with requirements. Coordinate equipment configuration to ensure that the height to the center of the grip on the operating handle of any device does not exceed 6'7" above finish floor. Edge distances from motor control center shall be a minimum of ten anchor bolt diameters to the edge of the concrete pad.

- B. Motor control centers not installed and energized immediately shall be stored in a clean, dry place. Maintain a storage temperature between -30 degrees C and +65 degrees C. If the storage temperature fluctuates or humidity exceeds 60%, use a space heater to prevent condensation.
- C. Coordinate with other electrical Work including wiring and raceway Work as necessary for proper interface of motor control center installation with other Work.
- D. Tighten bus connections and mechanical fasteners sufficiently tight to assure permanent and effective connections.
- E. Adjust and clean operating mechanisms for free mechanical movement. Touch up scratched or marred surfaces to match original finishes.
- F. Provide copper equipment grounding bus and connections sufficiently tight to assure permanent and effective ground for motor control centers as indicated.

### 3.02 FIELD QUALITY CONTROL

- A. Before energization of motor control centers, use resistance tester to test the phase-to-phase and phase-to-ground insulation for proper resistance levels. Perform inspections and tests as listed in NETA ATS Section 7.16.2.1.
- B. Before energization of circuitry, check motor control center electrical circuits for continuity and for short circuits.
- C. Subsequent to wire/cable and raceway hookups, energize motor control center circuitry and demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, and then retest to demonstrate compliance. Otherwise, remove and replace with new units and proceed with retesting.

END OF SECTION

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## SECTION 262713 METER MAIN EQUIPMENT

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of meter main equipment work is indicated by Drawings. Types of utility meter main equipment specified in this section include overhead construction style.
- B. Requirements of this section apply to meter main equipment work specified elsewhere in these specifications and shown on drawings.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of meter main equipment of types and ratings required, whose products have been in satisfactory use in similar service for not less than three years.
- B. California Electrical Code (CEC) Compliance: Comply with CEC requirements as to materials and installation of electrical meter mains, associated equipment, and wiring.
- C. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to meter main equipment and provide products and components that have been listed and labeled by an NRTL such as UL or equal.
- D. Utility Company Compliance: Comply with requirements of Pacific Gas & Electric, and EUSERC requirements pertaining to meter main equipment.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data on utility meter main equipment, including confirmation from Pacific Gas & Electric that the equipment is acceptable.

### PART 2- MATERIALS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering meter main equipment products that may be incorporated in the work include, but are not limited to Cooper, Milbank, or equal.

## 2.02 RATINGS

- A. Provide 240/120V, three-phase meter main rated for maximum 100A.
- B. Main disconnect shall be factory-assembled, molded case circuit breaker of frame size and number of poles as indicated. Circuit breaker shall be constructed using glass reinforced insulating material providing superior dielectric strength. Current-carrying components shall be completely isolated from the handle and accessory mounting area. Provide breakers with permanent thermal and instantaneous magnetic trips in each pole and with fault current protection and ampere ratings as indicated. Construct with overcenter, trip free, toggle type operating mechanisms with quick-make, quick-break action and positive handle trip indication
- C. Provide assembly with minimum 35kAIC.
- D. Enclosure shall be rated NEMA 3R and constructed using galvanized steel.
- E. Provide with 7 jaw meter socket compatible with PG&E requirements.

## PART 3- EXECUTION

### 3.01 INSTALLATION

- A. Install meter main as indicated, in accordance with manufacturer's written instructions, applicable requirements of CEC, and NEMA, utility company, and recognized industry practices to ensure that products fulfill requirements.
- B. Coordinate with other work, including electrical wiring work, as necessary to interface installation of product with other work.
- C. Verify tightness of bolted electrical connections by calibrated torque wrench according to manufacturer's published data.
- D. Set field adjustable circuit breakers for trip settings to coordinate with upstream and downstream circuit breakers, subsequent to installation of units.

### 3.02 ADJUST AND CLEAN

- A. Inspect circuit breaker operating mechanisms for malfunctioning and, where necessary, adjust units for free mechanical movement.

### 3.03 FIELD QUALITY CONTROL

- A. Prior to connection of utility power, test for continuity of circuitry and for short circuits. Perform an insulation resistance test at 1000 volts dc from pole to pole and from each pole to ground with breaker closed. Ensure proper phasing is



observed before connecting devices to existing distribution system. Correct malfunctioning units and then demonstrate compliance with requirements.

- B. Upon completion of installation of meter main, perform inspections and test the circuit breaker in accordance with NETA-ATS Section 7.6.1.1.

END OF SECTION

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## SECTION 262726 WIRING DEVICES

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. The extent of wiring device work is indicated by Drawings and as specified herein.
- B. Types of electrical wiring devices in this Section include receptacles, switches, faceplates, plugs and plug connectors, and accessories.

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of wiring devices of types, materials, and sizes required, whose products have been in satisfactory use in similar service for not less than three years.
- B. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to electrical wiring devices and provide products and components that have been listed and labeled by an NRTL such as UL or equal.
- C. NEMA Compliance: Comply with NEMA standards for general and specific purpose wiring devices.
- D. California Electrical Code (CEC) Compliance: Comply with CEC as applicable to construction and installation of electrical wiring devices.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data on electrical wiring devices and faceplates including color selections for all devices. Identify proposed wiring devices by manufacturer's catalog numbers.

### PART 2- MATERIALS

#### 2.01 GENERAL

- A. Provide factory-fabricated wiring devices in types, colors, and electrical ratings for applications indicated and complying with NEMA Standards Publication No. WD 1. Provide brown color devices except where otherwise indicated. Verify color selections with Engineer.

## 2.02 RECEPTACLES

- A. Ground-Fault Circuit-Interrupter (GFCI) Receptacles: GFCI receptacles shall be extra heavy duty industrial duplex, three-wire, NEMA 5-15R or 5-20R, 125-volt, parallel slot, weather resistant, polarized where indicated, in ivory color. GFCI receptacles shall be 20A feed-through type, capable of protecting connected downstream receptacles on single circuit, grounding type UL-rated Class A, 60 Hz, with brass strap and solid state ground fault sensing and signaling, with 4-6 milliamperes ground fault trip level. 15 amp devices shall be Hubbell GFR5262SGI, Leviton G5262-WTI, or equal. NEMA 5-20R receptacles shall be Hubbell GFR5362SGI, Leviton G5362-WTI, or equal.

## 2.03 SWITCHES

- A. Provide line voltage specification grade lighting circuit switches in ivory color at locations indicated on the Drawings.
- B. Snap Switches: Provide toggle switches, 20 ampere, 120/277 volts AC, quiet type with steel mounting strap insulated from mechanism. Equip with plaster ears, nylon or lexan switch handle, grounding terminal, and back and side wired screw terminals. Devices shall be single pole as manufactured by Hubbell 1221I, Leviton 1221-2I, or equal.

## 2.04 FACEPLATES

- A. Faceplates: Provide single switch and duplex outlet faceplates for wiring devices of types and sizes and with ganging and cutouts as indicated.
- B. Damp and Wet locations: Receptacle and switch covers shall be high impact polycarbonate NEMA 3R wet location labeled plate. Receptacle covers shall be provided with cover hood that maintains a weatherproof rating with the attachment plug cap inserted or removed. Cover hood shall be capable of being locked in the closed position with a padlock.
- C. Available Manufacturers: Subject to compliance with requirements, manufacturers offering faceplates that may be incorporated in the work include Hubbell, Leviton, or equal.

## PART 3- EXECUTION

### 3.01 INSTALLATION OF WIRING DEVICES

- A. Install wiring devices as indicated, in compliance with manufacturer's written instructions and with applicable requirements of CEC and of the NECA "Standard of Installation" and in accordance with recognized industry practices to fulfill project requirements.

- B. Coordinate with other work, including painting, electrical box and wiring work, as necessary to interface installation of wiring devices with other work.
- C. Install wiring devices only in electrical boxes that are clean and free from building materials, dirt, and debris.
- D. Delay installation of wiring devices until wiring work is completed.

### 3.02 ADJUST AND CLEAN

- A. Ensure proper and cautious use of convenience outlets, if used during construction. At time of Substantial Completion, replace those items that have been damaged, including those burned and scorched by faulty plugs.

### 3.03 FIELD QUALITY CONTROL

- A. Prior to energizing circuitry, test wiring devices for electrical continuity and proper polarity connections. After energizing circuitry, test wiring devices to demonstrate compliance with requirements.

END OF SECTION

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## SECTION 265000 LIGHTING

### PART 1- GENERAL

#### 1.01 SECTION INCLUDES

- A. Extent of luminaire work is indicated by Drawings and Schedules.
- B. Types of luminaires in this Section include units using LED lamp sources:

#### 1.02 QUALITY ASSURANCE

- A. Manufacturers: Firms regularly engaged in manufacture of luminaires of types and ratings required, whose products have been in satisfactory use in similar service for not less than five years.
- B. Nationally Recognized Testing Laboratory (NRTL) Compliance and Labeling: Comply with safety standards pertaining to luminaires and provide products and components that have been listed and labeled by an NRTL such as UL or equal.
- C. NEMA Compliance: Comply with applicable portions of NEMA Stds. No. LE 1 and LE 2 pertaining to lighting equipment.
- D. ANSI/IES Compliance: Comply with ANSI 132.1 standards pertaining to lighting.
- E. California Electrical Code (CEC) Compliance: Comply with CEC as applicable to construction and installation of electrical luminaires.

#### 1.03 SUBMITTALS

- A. Product Data: Submit manufacturer's data on luminaires with separate sheet for each fixture, assembled in luminaire "type" alphabetical order with proposed fixture and accessories clearly indicated on each sheet. Indicate specific lamp and driver types. Include input watts, starting, operating, and open-circuit current, power factor, and minimum starting temperature. Submit information indicating the type of LED lamps to be provided with each luminaire including color temperature and color rendering index. Provide certified photometric data for each luminaire.

### PART 2- MATERIALS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, provide products of manufacturers as specified on the Drawings.

## 2.02 LUMINAIRES

- A. General: Provide luminaires of sizes, types, ratings and manufacturer, complete with, but not necessarily limited to, housings, lamps, reflectors, lenses, and wiring as specified on the Drawings.

## 2.03 POLES AND STANDARDS

- A. Metal Lighting Poles: Provide metal, raceway-type lighting poles and standards, of sizes and types indicated, comprised of shaft, bracket, and anchor base. Construct of the following materials with additional construction features:
  - 1. Material: Aluminum as indicated on luminaire schedule.
  - 2. Configuration: Anchor base type with hand hole and cast cover as indicated on luminaire schedule.
  - 3. Handhole: Provide minimum 2"x4" handhole with watertight cover. Provide grounding terminal connection readily accessible from handhole.
- B. Metal Lighting Pole Accessories: Provide accessories for metal lighting poles, including galvanized anchor bolts, double nuts, and washers, as recommended by lighting standard manufacturer, of sizes and materials needed to meet erection and loading application requirements of new standards. Provide receptacle at +24" with a lockable in-use hood cover. Refer to Specification Section 262726 for Wiring Devices.

## PART 3- EXECUTION

### 3.01 INSTALLATION OF LUMINAIRES

- A. Install luminaires at locations and heights as indicated, complying with manufacturer's written instructions, and recognized industry practices to ensure that products fulfill requirements.
- B. Coordinate with other electrical work and work of all other Divisions as necessary for proper interface.
- C. Fasten luminaires securely to indicated structural support.
- D. Wire luminaires with conductors suitable for the voltage, current, and temperature to which the conductors will be subjected.

### 3.02 ADJUST AND CLEAN

- A. Clean luminaires of dirt and debris and replace burned-out lamps before final acceptance of the installation.



- B. Protect installed luminaires from damage during remainder of construction period.

### 3.03 FIELD QUALITY CONTROL

- A. Upon completion of installation of luminaires and after circuitry has been energized, apply electrical energy to demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance. Otherwise, remove and replace with new units, and proceed with retesting.
- B. Protect luminaires from damage during the remainder of construction period.

END OF SECTION

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## SECTION 312300 EARTHWORK

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, testing, and installation of earthwork for excavations, fills, and installation of earthwork for excavations, fills, structures, and accessory items such as filter and stabilization fabrics.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Protecting Existing Underground Utilities: 020120.
- B. General Concrete Construction: 030500.
- C. Trenching, Backfilling, and Compacting: 312316.

#### 1.03 SUBMITTALS

- A. Submit excavation and shoring drawings for worker protection in accordance with the Special Provisions.
- B. Submit an electronic copy of a report from a testing laboratory verifying that the material contains less than 0.25% asbestos by weight or volume and conforms to the gradation specified. Submit asbestos test results with the submittals for materials gradation. Material gradation reports without the accompanying asbestos test results will be rejected as incomplete. Submit manufacturer's catalog data and a sample of filter fabric. Submit manufacturer's installation instructions and details for filter fabric.
- C. Submit dewatering plan including disposition of groundwater
- D. Submit manufacturer's catalog data and samples of filter fabric and geotextiles. Submit manufacturer's installation instructions and details for filter fabric and geotextiles.

#### 1.04 TESTING FOR COMPACTION

- A. The Owner will test for compaction and relative density as described below.
- B. Determine the density of soil in place by nuclear methods, ASTM D6938. Compaction tests will be performed for each lift or layer.
- C. Determine laboratory moisture-density relations of soils per ASTM D1557. If nuclear methods are used for in-place density determination, the compaction test results for maximum dry density and optimum water content shall be

adjusted in accordance with ASTM D4718. This will be required for determination of percent relative compaction and moisture variation from optimum.

- D. Determine the relative density of open graded gravel per ASTM D4253 and D4254 as necessary.
- E. Sample materials per ASTM D75.
- F. "Relative compaction" is the ratio, expressed as a percentage, of the in-place dry density to the laboratory maximum dry density.
- G. Compaction shall be deemed to comply with the specifications when no more than one test falls below the specified relative compaction. The Contractor shall pay the costs of any retesting of work not conforming to the specifications.

#### 1.05 DISPOSAL OF EXCESS MATERIALS

Excess site excavated or wasted material shall be disposed of offsite by the Contractor at his expense. No prearranged disposal site or related permits have been determined or secured by the Owner.

#### 1.06 MATERIAL AVAILABILITY

Sufficient earthwork material to complete the work is not available at the site. Secure source of material and permits to complete the project requirements.

### PART 2- MATERIALS

#### 2.01 STRUCTURAL BACKFILL

- A. Structural backfill is material that is to be placed adjacent to and around piping and structures.
- B. Excavated onsite material may be used and shall be submitted to the Project Geotechnical Engineer and approved prior to use.

#### 2.02 IMPORT FILL

- A. Import fill for structural backfill shall be Class II aggregate base per Caltrans Standard Specifications.

#### 2.03 CRUSHED ROCK AND GRAVEL

- A. Crushed rock base and gravel are defined as natural or crushed rock, free from organic matter and containing less than 0.25% asbestos by weight or volume, and meeting the following gradation:

<b>Sieve Size</b>	<b>Percent Passing by Weight</b>
2 inch	100
1-1/2 inch	90 to 100
1 inch	20 to 55
3/4 inch	0 to 15
3/8 inch	0 to 5

- B. Durability Index shall be at least 40 per California Test Method No. 229.

2.04 FILL

Fill material is material that is to be placed in locations that are not to be constructed as structural fill or structural backfill. Fill material shall be native material.

2.05 SAND, INCLUDING IMPORTED SAND FOR PIPE ZONE AND PIPE BASE IN PIPE TRENCHES

- A. Granular material free from clay balls, organic matter, and other deleterious substances and conforming to the following gradations:

<b>Sieve Size</b>	<b>Percent Passing By Weight</b>
1 inch	100
No. 4	80 to 100
No. 200	0 to 15

- B. Sand shall have a minimum sand equivalent of 20 per ASTM D2419.

2.06 SAND-CEMENT SLURRY BACKFILL

Sand-cement slurry backfill shall consist of one sack (94 pounds) of Type I or II portland cement added per cubic yard of imported sand and sufficient water for workability.

2.07 WATER FOR COMPACTION

Water shall be free of organic materials and shall have a pH of 7.0 to 9.0, a maximum chloride concentration of 500 mg/L, and a maximum sulfate concentration of 500 mg/L. Provide all water needed for earthwork. Provide temporary piping and valves to convey water from the source to the point of use.

## 2.08 FILTER FABRIC

- A. Non-woven filter fabric shall conform to Caltrans Section 96-1.02B of the California Department of Transportation Standard Specifications.

## 2.09 STABILIZATION FABRIC

- A. Woven stabilization fabric shall conform to Caltrans Section 96-1.02D of the California Department of Transportation Standard Specifications.

## PART 3- EXECUTION

### 3.01 DEWATERING

Provide dewatering per Specification Section 312319.

### 3.02 EXCAVATION

- A. Excavations shall have sloping, sheeting, shoring, and bracing conforming with 29 CFR 1926 Subpart P-Excavations, CAL/OSHA requirements, and the Special Provisions.
- B. Excavation is unclassified. Perform excavation regardless of the type, nature, or condition of the material encountered to accomplish the construction. Do not operate excavation equipment within 5 feet of existing structures or newly completed construction. Excavate with hand tools in these areas.
- C. After the required excavation has been completed, the Owner will observe the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation is to be conducted in all areas within the influence of the structure where unacceptable subgrade materials exist at the exposed subgrade. Overexcavation shall include the removal of all such unacceptable material that exists directly beneath the structure or within a zone outside and below the structure defined by a line sloping at 1-horizontal to 1-vertical from 1 foot outside the edge of the footing. Refill the over-excavated areas with structural backfill material.
- D. The Contractor will not receive any additional payment for refill material used for his convenience.

### 3.03 LIMITS OF FOUNDATION EXCAVATION

Excavate to the depths and widths needed to accomplish the construction. Allow for forms, working space, structural backfill, and site grading. Do not excavate for footings, slabs, or conduits below elevations indicated. Unless unacceptable material is encountered and overexcavation is authorized by the Owner, backfill overexcavations with compacted structural backfill material. Correct cuts below

grade by benching adjoining areas and creating a smooth transition. The Contractor shall bear all costs for correcting unauthorized overexcavated areas.

#### 3.04 PREPARATION OF FOUNDATION SUBGRADE

- A. The finished subgrade shall be within a tolerance of  $\pm 0.08$  of a foot of the grade and cross section indicated, shall be smooth and free from irregularities, and shall be at the specified relative compaction. The subgrade shall extend over the full width and extend 1 foot beyond the edge of the foundations.
- B. Compact the top 12 inches of the subgrade to the degree practicable to facilitate the placement of geotextile fabrics and gravel.

#### 3.05 PREPARATION FOR PLACING FILL OR BACKFILL

- A. Remove foreign materials and trash from the excavation before placing any fill material.

#### 3.06 PLACING AND COMPACTING CRUSHED GRAVEL FOR BURIED STRUCTURES BELOW WATER TABLE

- A. After excavation of existing material or removal of unacceptable material at the exposed subgrade, place one layer of filter fabric and stabilization fabric over the exposed subgrade and place 24 inches of crushed gravel. Gravel shall extend 18-inches beyond the structure. Cover the crushed gravel with one layer filter fabric and stabilization fabric (completely encapsulate the crushed gravel with the filter and stabilization fabric). Ensure minimum 12-inch overlap.
- B. Place crushed gravel in maximum 8-inch lifts and compact each lift to 90% relative compaction.

#### 3.07 PLACING AND COMPACTING CRUSHED GRAVEL FOR BURIED STRUCTURES ABOVE WATER TABLE

- A. After excavation of existing material or removal of unacceptable material at the exposed subgrade, place one layer of filter fabric and stabilization fabric over the exposed subgrade and place 12 inches of crushed gravel. Gravel shall extend 12-inches beyond the structure. Cover the crushed gravel with one layer filter fabric and stabilization fabric (completely encapsulate the crushed gravel with the filter and stabilization fabric). Ensure minimum 12-inch overlap.
- B. Place crushed gravel in maximum 8-inch lifts and compact each lift to 90% relative compaction.

### 3.08 PLACING AND COMPACTING STRUCTURAL BACKFILL

- A. Place structural backfill material around piping, structures, channels, and other areas, including authorized overexcavation areas, to the lines and grades shown or specified. Do not exceed loose lifts of 8 inches.
- B. Limits of Structural Backfill: Limits of structural backfill shall be 18 inches from edge of footing and shall extend at a 1:1 slope to the finish grade.
- C. Compact each lift to 95% relative compaction, unless otherwise shown in the drawings. Stop structural backfill at least 6 inches below finished grade in all areas where topsoil is to be placed.
- D. Backfill around concrete structures as specified in Section 030500.
- E. Do not operate earthmoving equipment within 5 feet of walls of concrete structures. Place and compact backfill adjacent to concrete walls with hand-operated tampers or other equipment that will not damage the structure.

### 3.09 MOISTURE CONTROL

During the compacting operations, maintain optimum practicable moisture content required for compaction purposes in each lift of the material. Maintain uniform moisture content throughout the lift. Insofar as practicable, add water to the material at the site of excavation. Supplement by sprinkling the material. At the time of compaction, the water content of the material shall be at optimum water content or within 2 percentage points above optimum. Aerate material containing excessive moisture by blading, discing, or harrowing to hasten the drying process.

### 3.10 SITE GRADING

Perform earthwork to the lines and grades shown in the drawings. Shape, trim, and finish slopes of channels to conform to the lines, grades, and cross sections as shown. Remove exposed roots and loose rocks exceeding 3 inches in diameter. Round tops of banks to circular curves of not less than a 6-foot radius. Neatly and smoothly trim rounded surfaces. Do not overexcavate and backfill to achieve the proper grade.

END OF SECTION



## SECTION 312316 TRENCHING, BACKFILLING, AND COMPACTING

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, testing, and installation for pipeline trench excavation, backfilling, and compacting.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Existing Conditions: General Conditions.
- B. Protecting Existing Underground Utilities: 020120.
- C. General Concrete Construction: 030500.
- D. Earthwork: 312300.
- E. Pressure Testing of Piping: 400515.

#### 1.03 SUBMITTALS

- A. Submit a copy of a report from a testing laboratory verifying that material contains less than 0.25% asbestos by weight or volume and conforms to the specified gradations or characteristics for pea gravel, granular material, imported sand, rock refill for foundation stabilization, and water. Submit asbestos test results with the submittals for materials gradation. Material gradation reports without the accompanying asbestos test results will be rejected as incomplete.
- B. Submit method(s) of compaction including removal sequence of shoring where used.

#### 1.04 TESTING FOR COMPACTION

- A. The Owner will test for compaction as described in Section 312300.
- B. Where compaction tests indicate a failure to meet the specified compaction, the Owner will take additional tests every 25 feet in each direction until the extent of the failing area is identified. Rework the entire failed area until the specified compaction has been achieved.

#### 1.05 PAVEMENT ZONE

The pavement zone includes the asphalt concrete and aggregate base pavement section placed over the trench backfill.

1.06 TRENCH ZONE

The trench zone includes the portion of the trench from the top of the pipe zone to the bottom of the pavement zone in paved areas or to the existing surface in unpaved areas.

1.07 PIPE ZONE

The pipe zone shall include the full width of trench from the bottom of the pipe or conduit to a horizontal level above the top of the pipe, as specified below. Where multiple pipes or conduits are placed in the same trench, the pipe zone shall extend from the bottom of the lowest pipe to a horizontal level above the top of the highest or topmost pipe. Thickness of pipe zone above the highest top of pipe shall be as follows unless otherwise shown in the drawings or otherwise described in the specifications for the particular type of pipe installed.

<b>Pipe Diameter</b>	<b>Thickness of Pipe Zone Above Top of Pipe</b>
6 inches or smaller	12 inches
8 inches and larger	12 inches

1.08 PIPE BASE OR BEDDING

The pipe base or bedding shall be defined as a layer of material immediately below the bottom of the pipe or conduit and extending over the full trench width in which the pipe is bedded. Thickness of pipe base shall be as follows unless otherwise shown in the drawings or otherwise described in the specifications for the particular type of pipe installed.

<b>Pipe Diameter</b>	<b>Thickness of Pipe Base</b>
Smaller than 4 inches	4 inches
4 inches through 16 inches	4 inches

PART 2- MATERIALS

2.01 NATIVE EARTH BACKFILL-- TRENCH ZONES

- A. Native earth backfill used above the pipe zone shall be excavated fine-grained materials free from roots, debris, rocks larger than 3 inches, asbestos, organic matter, clods, clay balls, broken pavement, and other deleterious materials. At least Less 20% shall pass a No. 200 sieve. At least 35% shall pass a No. 4 sieve.

Backfill materials that are obtained from trench excavated materials to the extent such material is available shall be either screened directly into the trench or

screened during the trenching operation. If screened during trenching, the material shall be maintained free of unscreened material during the handling and backfilling process. Hand selecting of rocks from earth as it is placed into the trench will not be permitted in lieu of the specified screening. Under no circumstances will native earth backfill be allowed or used in the pipe base or pipe zone areas. Backfill shall be moisture conditioned to within approximately 2% of the optimum moisture content prior to being placed in trench.

2.02 IMPORTED SAND--PIPE ZONE AND PIPE BASE

See Section 312300.

2.03 GRAVEL AND CRUSHED ROCK--PIPE ZONE AND PIPE BASE

- A. Gravel or crushed rock material shall contain less than 0.25% asbestos by weight or volume and conform to the following gradation (No. 4 per ASTM C-33-13):

<b>Sieve Size</b>	<b>Percent Passing by Weight</b>
2-inch	100
1-1/2 inch	90 to 100
1 inch	20 to 55
3/4 inch	0 to 15
3/8 inch	0 to 5

2.04 SAND-CEMENT SLURRY BACKFILL--TRENCH ZONE

Sand-cement slurry backfill shall consist of one sack (94 pounds) to 1.5 sacks (141 pounds) of Type I or II Portland cement added per cubic yard of imported sand and sufficient water for workability.

2.05 ROCK REFILL FOR FOUNDATION STABILIZATION

Rock refill shall be crushed or natural rock containing less than 0.25% asbestos by weight or volume, have the following gradation:

<b>Sieve Size</b>	<b>Percent Passing By Weight</b>
3 inches	100
1 1/2 inches	70 to 100
3/4 inch	60 to 100
No. 4	25 to 55
No. 30	10 to 30
No. 200	0 to 10

## 2.06 WATER FOR COMPACTION

See Section 312300. Water shall be free of organic materials injurious to the pipe coatings.

## PART 3- EXECUTION

### 3.01 SLOPING, SHEETING, SHORING, AND BRACING OF TRENCHES

Trenches shall have sloping, sheeting, shoring, and bracing conforming with 29 CFR 1926, Subpart P - Excavations, CAL/OSHA requirements, and the Special Provisions.

### 3.02 SIDEWALK, PAVEMENT, AND CURB REMOVAL

Cut bituminous and concrete pavements regardless of the thickness and curbs and sidewalks prior to excavation of the trenches with a pavement saw or pavement cutter. Width of the pavement cut shall be at least equal to the required width of the trench at ground surface. Haul pavement and concrete materials from the site. Do not use for trench backfill.

### 3.03 TRENCH EXCAVATION

- A. Excavate the trench to the lines and grades shown in the drawings with allowance for pipe thickness, sheeting and shoring if used, and for pipe base or special bedding. If the trench is excavated below the required grade, refill any part of the trench excavated below the grade at no additional cost to the Owner with imported sand. Place the refilling material over the full width of trench in compacted layers not exceeding 8 inches deep to the established grade with allowance for the pipe base or special bedding.
- B. Trench widths in the pipe zone shall be as shown in the drawings. If no details are shown, maximum width shall be 24 inches greater than the pipe outside diameter. Comply with 29 CFR Part 1926 Subpart P - Excavations. 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 2 feet between the top edge of the trench and the structure or footing.

- C. Construct trenches in rock by removing rock to a minimum of 6 inches below bottom of pipe and backfilling with imported sand.

#### 3.04 LOCATION OF EXCAVATED MATERIAL

- A. During trench excavation, place the excavated material only within the working area. Do not obstruct any roadways or streets. Do not place trench spoil over pipe, buried utilities, manholes, or vaults. Conform to federal, state, and local codes governing the safe loading of trenches with excavated material.
- B. Coordinate the allowable distance of trench spoil from the edge of the trench with the recommendations of the geotechnical report.
- C. Locate trench spoil piles at least 15 feet from the tops of the slopes of trenches. Do not operate cranes and other equipment on the same side of the trench as the spoil piles.

#### 3.05 LENGTH OF OPEN TRENCH

Limit the length of open trench to 300 feet in advance of pipe laying or amount of pipe installed in one working day. Complete backfilling and temporary or first layer paving not more than 5 feet in the rear of pipe laying.

#### 3.06 DEWATERING

Provide and maintain means and devices to remove and dispose of water entering the trench excavation during the time the trench is being prepared for the pipe laying, during the laying of the pipe, and until the backfill at the pipe zone has been completed. These provisions shall apply during both working and nonworking hours, including lunchtime, evenings, weekends, and holidays. Dispose of the water in a manner to prevent damage to adjacent property and in accordance with regulatory agency requirements. Do not drain trench water through the pipeline under construction.

#### 3.07 FOUNDATION STABILIZATION

- A. After the required excavation has been completed, the Owner will inspect the exposed subgrade to determine the need for any additional excavation. It is the intent that additional excavation be conducted in all areas within the influence of the pipeline where unacceptable materials exist at the exposed subgrade. Overexcavation shall include the removal of all such unacceptable material that exist directly beneath the pipeline to a width 24 inches greater than the pipe outside diameter and to the depth required.

- B. Place filter fabric on the bottom of the trench and up the sides a sufficient height to retain rock refill material. Backfill the trench to subgrade of pipe base with rock refill material for foundation stabilization. Place the foundation stabilization material over the full width of the trench and compact in layers not exceeding 8 inches deep to the required grade. Foundation stabilization work shall be executed in accordance with a change order.
- C. Rock refill used by the Contractor for his convenience will not be cause for any additional payment.

### 3.08 INSTALLING BURIED PIPING

- A. Grade the bottom of the trench to the line and grade to which the pipe is to be laid, with allowance for pipe thickness. Remove hard spots that would prevent a uniform thickness of bedding. Place the specified thickness of pipe base material over the full width of trench. Grade the top of the pipe base ahead of the pipe laying to provide firm, continuous, uniform support along the full length of pipe, and compact to the relative compaction specified herein. Before laying each section of the pipe, check the grade and correct any irregularities.
- B. Excavate bell holes at each joint to permit proper assembly and inspection of the entire joint. Fill the area excavated for the joints with the bedding material specified or indicated in the drawings for use in the pipe zone. If no bedding material is specified or indicated, use imported sand.
- C. Inspect each pipe and fitting before lowering the buried pipe or fitting into the trench. Inspect the interior and exterior protective coatings. Patch damaged areas in the field with material recommended by the protective coating manufacturer. Clean ends of pipe thoroughly. Remove foreign matter and dirt from inside of pipe and keep clean during and after installation.
- D. Handle pipe in such a manner as to avoid damage to the pipe. Do not drop or dump pipe into trenches under any circumstances.
- E. When installing pipe, do not deviate more than 1 inch from line or 1/4 inch from grade. Measure elevation at the pipe invert.
- F. 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. If no pipe zone material is specified or indicated, use imported sand. Carefully place the material around the pipe so that the pipe barrel is completely supported and no voids or uncompacted areas are left beneath the pipe. Use particular care in placing material on the underside of the pipe to prevent lateral movement during subsequent backfilling.
- G. Compact each lift to the relative compaction specified herein.

- H. Push the backfill material carefully onto the backfill previously placed in the pipe zone. If no backfill material is otherwise specified or indicated, use granular material for backfill. Do not permit free-fall of the material until at least 2 feet of cover is provided over the top of the pipe. Do not drop sharp, heavy pieces of material directly onto the pipe or the tamped material around the pipe. Do not operate heavy equipment or a sheepsfoot wheel mounted on a backhoe over the pipe until at least 3 feet or one-half of the internal diameter, whichever is greater, of backfill has been placed and compacted over the pipe.
- I. When the pipe laying is not in progress, including the noon hours, close the open ends of pipe. Do not allow trench water, animals, or foreign material to enter the pipe.
- J. Keep the trench dry until the pipe laying and jointing are completed.

### 3.09 BACKFILL COMPACTION

- A. Unless otherwise shown in the drawings or otherwise described in the specifications for the particular type of pipe installed, relative compaction in pipe trenches shall be as follows:
  - 1. Pipe Zone: 90% relative compaction.
  - 2. Backfill in Trench Zone Not Beneath Paving: 90% relative compaction. Compact backfill within embankment above the pipe zone to the same relative compaction as the adjacent embankment as specified in Section 312300.
  - 3. Backfill in Trench Zone to Pavement Zone in Paved Areas: 95% relative compaction.
  - 4. Rock Refill for Foundation Stabilization: 80% relative density.
  - 5. Refill for Overexcavation: 80% relative density.
- B. Compact trench backfill to the specified relative 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.
- C. Compact material placed within 12 inches of the outer surface of the pipe by hand tamping only.
- D. Do not use any axle-driven or tractor-drawn compaction equipment within 5 feet of building walls, foundations, and other structures.

### 3.10 MATERIAL REPLACEMENT

Remove and replace any trenching and backfilling material that does not meet the specifications, at the Contractor's expense.

### 3.11 PLACING SAND-CEMENT SLURRY BACKFILL

Place sand-cement slurry backfill in a uniform manner that will prevent voids in or segregation of the material. Remove foreign material that falls into the excavation or trench. Do not commence backfilling over or place any material over the slurry cement backfill until at least four hours after placing the sand-cement slurry.

END OF SECTION



## SECTION 312319 DEWATERING

### PART 1- GENERAL

#### 1.01 DESCRIPTION:

- A. Design, furnish, operate, maintain, and remove temporary dewatering systems to control groundwater and surface water to maintain stable, undisturbed subgrades, and permit work to be performed under dry and stable conditions. Work to be done as part of dewatering includes, but is not limited to:
  - 1. Lower the groundwater level.
  - 2. Lower hydrostatic pressure.
  - 3. Prevent surface water from entering the excavation during construction.
  - 4. Implement erosion control measures for disposing of discharge water.
  - 5. Provide groundwater recharging systems as specified and as indicated.
  - 6. Provide and monitor observation wells and geotechnical instrumentation as specified and indicated.
- B. Groundwater within the excavation area shall be lowered to at least 2 feet below the lowest excavation levels as specified and as indicated.
- C. Common dewatering methods include, but are not limited to, deep wells, well points, vacuum well points, or combinations thereof.
- D. Common groundwater recharge methods include, but are not limited to, deep wells, large sumps, or combination thereof.
- E. The Contractor shall obtain the required permits for discharge from the Contractor's dewatering systems in accordance with 40 CFR Part 122 and specification section 011100.

#### 1.02 REFERENCES:

- A. Code of Federal Regulations, Title 40 – Protection of Environment (CFR):

#### 1.03 RELATED WORK SPECIFIED ELSEWHERE

- A. Coordination of Work, Permits, and Regulations: 011100.
- B. Earthwork: 312300.

C. Shoring: 314100.

1.04 SUBMITTALS:

A. Submit the following in accordance with Special Provisions and Section 013300.

1. Qualification of the Contractor's dewatering specialist's or firm's qualifications a minimum of four (4) weeks prior to dewatering work. The submittal shall include, but not be limited to:
  - a. Qualifications of specialist's or firm's California Registered Professional Engineer.
  - b. Qualifications of specialist's or firm's field representative who will oversee the installation, operation and maintenance of the dewatering system.
2. Submit a dewatering plan, and, if applicable, a groundwater recharge plan at least two (2) weeks prior to start of dewatering work. Do not submit design calculations. The review will be for the information of the Owner and third parties for an overall understanding of the project relating to access, maintenance of existing facilities and proper utilization of the site. The Contractor shall remain responsible for the adequacy and safety of the means, methods and sequencing of construction. The plan shall include the following items at a minimum:
  - a. Dewatering plan and details stamped and signed by a Registered Professional Engineer registered in the state where the project resides.
  - b. A list of equipment including, but not limited to, pumps, prime movers, and standby equipment.
  - c. Detailed description of dewatering, maintenance, and system removal procedures.
  - d. Monitoring plan and details, including, but not limited to, number and locations of observation wells, and geotechnical instruments such as settlement markers (reference points on structures) and piezometers, and frequency of reading the monitoring devices, Erosion and sedimentation control measures, and methods for disposal of pumped water.
  - e. List of all applicable laws, regulations, rules, and codes to which dewatering design conforms.

- f. List of data used for the design of dewatering and for groundwater recharge systems, including but not limited to groundwater levels, soil profile, permeabilities, and duration of pumping and or recharge.
- g. Measurement records consisting of observation well groundwater records and the geotechnical instrumentation readings within one day of monitoring.
- h. A modified dewatering plan within 24 hours, if pumping results in boils, loss of fines, or softening of the ground.

1.05 QUALITY ASSURANCE:

- A. Employ the services of a geotechnical engineer and a dewatering specialist or firm having the following qualifications:
  - 1. Have completed at least five (5) successful dewatering projects of equal size and complexity and with equal systems within the last 5 years.
  - 2. Retain the services of a Registered Professional Engineer (in the state where the project is located) having a minimum of 5 years experience in the design of well points, deep wells, recharge systems, or equal systems.
  - 3. Retain the services of a field representative having a minimum of 5 years experience in installation of well points, deep wells, recharge systems, or equal systems.
- B. If subgrade soils are disturbed or become unstable due to dewatering operation or an inadequate dewatering system, notify the Owner's Representative, stabilize the subgrade, and modify system to perform as specified.
- C. Notify the Owner's Representative immediately if settlement or movement is detected on structures. If the settlement or movement is deemed by the owner's representative to be related to the dewatering, take actions to protect the adjacent structures and submit a modified dewatering plan to the owner's representative within 24 hours. Implement the modified plan and repair damage incurred to adjacent structures.
- D. Notify the Owner's Representative immediately if settlement or movement is detected on structures.
- E. Immediately notify the Owner's Representative if oil or other hazardous materials are encountered after dewatering begins.

1.06 HYDRAULIC UPLIFT OF STRUCTURES:

- A. The Contractor shall be responsible for the protection of all structures against hydraulic uplift until such structures have been accepted by the Owner.

- B. The Contractor is advised that the structures, when completed and backfilled, are designed to resist hydraulic uplift from groundwater up to the elevation indicated on the structural drawings when the structure is completed. The structure bottoms shall be placed in the dry, with the use of wellpoints or other dewatering means to keep the water elevation sufficiently low to carry on the work.

1.07 PRECAUTIONS AGAINST HYDROSTATIC UPLIFT DURING CONSTRUCTION:

- A. The Contractor shall maintain a low groundwater elevation in the vicinity of the structures until they are complete. In case of extremely high water during construction of the structures, it may be necessary to flood the structures to maintain stable conditions.

1.08 SITE CONDITIONS:

- A. Subsurface Conditions: Geotechnical Engineering Report by Earth Systems Pacific (November 9, 2016) is available for review by request from Owner's Representative. The Contractor shall develop his own geotechnical investigation to support the design and implementation of the dewatering system.
- B. Contractor to design dewatering system for a dewatering rate of up to 400 gpm.

PART 2 PRODUCTS

2.01 MATERIALS:

- A. Provide observation wells in accordance with the submitted dewatering plan or as specified.
- B. Provide settlement markers, piezometers and other geotechnical instruments in accordance with the submitted dewatering plan or as specified.
- C. Provide casings, well screens, piping, fittings, pumps, power and other items required for dewatering system.
- D. Provide sand and gravel filter around the well screen. Wrapping geotextile fabric directly around the well screen shall not be allowed.
- E. When deep wells, well points, or vacuum well points are used, provide pumping units capable of maintaining high vacuum and handling large volumes of air and water at the same time.
- F. Provide auxiliary dewatering equipment in the event of breakdown. Equipment shall consist of pumps and hoses and be stored on site. Provide at least 1 pump for every 5 pumps used.

- G. Provide a reliable source of power to pump and a standby generator to maintain integrity of dewatering plan.
- H. Provide and maintain erosion and sedimentation control devices as indicated or specified and in accordance with the dewatering plan.
- I. Provide temporary pipes, hoses, flumes, or channels for the transport of discharge water to the discharge location.
- J. Provide cement grout having a water cement ratio of 1 to 1 by volume.

### PART 3- EXECUTION

#### 3.01 INSTALLATION:

- A. Execution of earth excavation and dewatering shall not commence until the related submittals have been reviewed by the owner's representative with all owner's representative's comments satisfactorily addressed and the geotechnical instrumentation has been installed.
- B. Provide and maintain dewatering system in accordance with the dewatering plan.
- C. Carry out dewatering program in such a manner as to prevent undermining or disturbing foundations of existing structures or of work ongoing or previously completed.
- D. Do not excavate until the dewatering system is operational.
- E. Unless otherwise specified, continue dewatering uninterrupted until all structures, pipes, and appurtenances below groundwater level have been completed such that they will not be floated or otherwise damaged by an increase in groundwater elevation.
- F. Open pumping from sumps and ditches is not allowed.
- G. Where subgrade materials are disturbed or become unstable due to dewatering operations, remove and replace the materials in accordance with Section 312300.
- H. Dewatering Discharge:
  - 1. Install sand and gravel filters in conjunction with well points and deep wells to prevent the migration of fines from the existing soil during the dewatering operation.

2. Transport pumped or drained water to discharge location without interference to other work, damage to pavement, other surfaces, or property. Available infrastructure may include the existing wet well, sewage pumps, and force main.
3. Do not discharge water from dewatering operations directly into any live or intermittent stream, channel, wetlands, or any surface water. Water from dewatering operations shall be treated by filtration, settling basins, or other approved method to reduce the amount of sediment contained in the water to allowable levels. Provide the infrastructure to discharge into the Owner's existing or proposed sewer system. Provide the Owner's Representative with sufficient information on the groundwater quality and sufficiently reduce sediment prior to discharge into the sewer system. Discharge to the sewer system must be coordinated with the owner's representative seven days ahead of the Contractor's planned operations.
4. The owner reserves the right to sample discharge water at any time.
5. Immediately notify the owner's representative if suspected contaminated groundwater is encountered. Do not pump water found to be contaminated with oil or other hazardous material to the discharge locations.

I. Monitoring Devices and Records:

1. Install, maintain, monitor and take readings from the observation wells and geotechnical instruments in accordance with the dewatering plan.
2. Perform and report baseline settlement survey readings prior to dewatering.
3. Install settlement markers on structures within the zone of influence for dewatering a distance equal to twice the depth of the excavation, from the closest edge of the excavation. Conduct and report settlement surveys to 1/8-inch.

J. Install and maintain erosion/sedimentation control devices at the point of discharge as indicated or specified and in accordance with the dewatering plan.

K. Removal:

1. Do not remove dewatering system without written acceptance from the Owner's Representative.
2. Backfill and compact sumps or ditches with screened gravel or crushed gravel wrapped with filter fabric in accordance with Section 312300.
3. All dewatering wells shall be abandoned upon completion of the work, and completely backfilled with cement grout.

END OF SECTION

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## SECTION 314100 SHORING

### PART 1- GENERAL

#### 1.01 DESCRIPTION

The Work specified in this Section includes the requirements necessary to design, provide, and maintain shielding, shoring, sheeting, bracing, and trench support systems, hereinafter called "shoring," as necessary to support the sides of excavations and to prevent detrimental settlement and lateral movement of existing facilities, adjacent property, and completed Work.

#### 1.02 DEFINITIONS

- A. Positive Excavation Support: Excavation support systems shall be designed by the Contractor and a Professional Engineer licensed in the State of California and shall be designed to limit horizontal and vertical movement to less than 1/2-inch at any location behind the excavation support system.
- B. Shoring Influence Area: Area within planes sloped downward and outward at 45-degree angle from horizontal measured from:
  - 1. 2-foot outside outermost edge at base of foundations or slabs.
  - 2. 2-foot outside outermost edge at surface of roadways or shoulder.
  - 3. 1-foot outside exterior at spring line of pipes.

#### 1.03 SUBMITTALS

- A. Informational Submittals:
  - 1. Excavation support plan.
  - 2. Engineered systems working Drawings.
  - 3. Utility protection plan.
  - 4. Movement monitoring plan.
  - 5. Movement measurement and data reduced results indicating movement trends.

#### 1.04 SEQUENCING AND SCHEDULING

Dewatering: Conform to applicable requirements of Section 312319, Dewatering, prior to initiating excavation.

## 1.05 SITE CONDITIONS

Subsurface Conditions: Geotechnical Engineering Report by Earth Systems Pacific (November 9, 2016) is available at the City's office for review. The contractor shall develop his own geotechnical investigation to support the design and implementation of the shoring system.

## PART 2- PRODUCTS (NOT USED)

## PART 3- EXECUTION

### 3.01 GENERAL

- A. For trench excavation exceeding 4 feet in depth, provide adequate safety system meeting requirements of applicable state and local construction safety orders, and federal requirements.
- B. "Construction Slopes" may be shown on the Drawings. These are shown for illustrative purposes only and are not intended to be inferred to represent a stable slope configuration. Contractor shall design slope and determine construction method and slope configuration necessary to complete excavations for the specified Work.
- C. Excavation sloping and benching may be used for excavations that are outside the influence area of existing structures and pipelines and are no deeper than ten feet below grade. Sloping and benching limits shall be within the work limits.
- D. Provide positive excavation support for construction of the Pioneer Lift Station. Stepped shoring systems which require excavating prior to shoring will not be allowed.
- E. All shoring shall be designed for undrained soil conditions.
- F. Engineered Systems:
  - 1. Engineered shoring is required for temporary earth support for trenches or excavations greater than 10 feet deep.
  - 2. Engineered shoring is required for areas subject to groundwater, utility crossings, or where required on the Drawings.
  - 3. Contractor shall retain a Professional Engineer licensed in the State of California to design engineered shoring conforming to OSHA and California OSHA.

### 3.02 EXCAVATION SUPPORT PLAN

Prepare excavation support plan addressing following topics:

1. Details of shoring, bracing, sloping, or other provisions for worker protection from hazards of caving ground.
2. Detailed Construction Sequence Description: Detail installation, excavation, maintenance, pipe or structure installation sequencing, backfill, and removal requirements.
3. Engineered system working Drawings shall be sealed by professional engineer licensed in the State of California and specified in Section 3.03, Engineered System Working Drawings, hereinafter.
4. Other Shoring Systems: Detail pipe installation, manhole installation, structure installation, support and protection of existing utilities, lateral connection, miters, and other non-linear area. Provided tabulated data.
5. Proposed locations of stockpiled excavated material.
6. Minimum lateral distance from the crest of slopes for vehicles and stockpiled excavated materials.
7. Anticipated difficulties and proposed resolutions including installation and removal of shoring: The site is underlain by stiff clay materials and the Contractor's attention is drawn to potential difficulties associated with the removal of shoring systems in this material with groundwater present.

### 3.03 ENGINEERED SYSTEM WORKING DRAWINGS

A. Address the following:

1. Details, arrangement and methods of assembly, method of disassembly of proposed system, and sequence of construction.
2. Method of supporting horizontal loading by bracing or tiebacks. Provide methods for preloading the bracing, preload values, and tieback loads.
3. Full excavation depth.
4. Loads on the support system for various stages of excavation, bracing, and/or tieback installation and removal and concrete and backfill placement.
5. Expected surcharge loads.
6. Maximum design load to be carried by the various members of the support system.

7. The depth below the main excavation to which the support system is to be installed.
8. Existing Utilities and Facilities: After checking locations of existing utilities and facilities, revise Drawings to show actual locations of facilities and excavation supports, interference with proposed work, and measures proposed to overcome such interference.
9. Allowable shoring deflections.
10. Equipment used for installation. The Contractors attention is drawn to the location of nearby improvements and structures relative to the project. Use of vibratory type equipment and potential detrimental effects should be fully evaluated prior to use.

#### 3.04 UTILITY PROTECTION PLAN

Prepare utility protection plan stamped by a Professional Engineer licensed in the State of California addressing the following topics:

1. Location of all utilities impacted by construction by type, size, and condition of use.
2. Methods to locate each and every utility.
3. List of utility owners and 24-hour emergency contact number.
4. Methods to support utilities while in full operation.
5. Hours of planned shutdown of utilities, if planned.
6. Correspondence confirmation from all utilities that proposed plans meet utility's approval.

#### 3.05 MOVEMENT MONITORING PLAN

A. Prepare movement monitoring plan to monitor settlement in nearby structures and improvements and addressing following topics:

1. Survey control.
2. Location of monitoring points.
3. Plots of data trends.
4. Intervals between surveys.
5. Correction methods for exceeding tolerances specified in Subsection 1.02 Definitions, Paragraph Positive Excavation Support, hereinbefore. Any

measured movement should be brought to the attention of the Owner's Representative.

### 3.06 REMOVAL OF EXCAVATION SUPPORT

- A. Remove excavation support in a manner that will maintain support as excavation is backfilled.
- B. Do not begin to remove excavation support until support can be removed without damage to existing facilities, completed Work, or adjacent property and work has been inspected.
- C. Remove excavation support in a manner that does not leave voids in the backfill.

END OF SECTION

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## SECTION 321216 ASPHALT CONCRETE PAVING

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, testing, and installation of asphalt concrete pavement, aggregate base course, prime coat, tack coat, and seal coat.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Trenching, Backfilling, and Compacting: 312316.

#### 1.03 SUBMITTALS

Submit electronic copy of a report from a testing laboratory verifying that aggregate material contains less than 0.25% asbestos by weight or volume and conforms to the specified gradations or characteristics.

#### 1.04 TESTING FOR COMPACTION

- A. The Owner will test for compaction as described in Section 312300.

#### 1.05 STANDARD SPECIFICATIONS

Wherever reference is made to the Standard Specifications such reference shall mean the City of Santa Maria Standard Specification for Materials and the Construction of an Asphaltic Concrete Pavement in the City of Santa Maria, California, Revised December 2006.

Wherever reference is made to the Caltrans Standard Specifications, such reference shall mean the State of California, Business, Transportation, and Housing Agency, Department of Transportation Standard Specifications, 2015.

### PART 2- MATERIALS

#### 2.01 ASPHALT CONCRETE PAVING

Asphalt concrete paving shall conform to Type B in Section 39 of the Caltrans Standard Specifications. Base course shall have  $\frac{3}{4}$ -inch aggregate. Finish course shall have  $\frac{1}{2}$ -inch maximum medium grading. Base and finish course are described in the Standard Specifications.

## 2.02 AGGREGATE BASE COURSE

Aggregate base shall be Class 2 aggregate base, 3/4-inch-maximum size per Section 26 of the Caltrans Standard Specifications. Aggregate shall contain less than 0.25% asbestos by weight or volume.

## 2.03 TACK COAT

Tack coat shall conform with Section 94, Grade SS-1 in the Caltrans Standard Specifications.

## 2.04 ASPHALT

Asphalt shall be Performance Grade PG 64-10 per Section 92 in the Caltrans Standard Specifications. Asphalt content in the pavement shall be 5.5% to 6.0%.

## 2.05 AGGREGATE FOR ASPHALT CONCRETE

Aggregate shall conform to requirements of Section 26, Class 2, 3/4 inch (3/4" maximum) in the Caltrans Standard Specifications. Aggregate shall contain less than 0.25% asbestos by weight or volume.

## 2.06 SEAL COAT

Seal coat shall be Type II slurry seal per Section 37 of the Caltrans Standard Specifications or fog type per Section 37 of the Caltrans Standard Specifications.

## 2.07 WOOD HEADERS

Size of wood headers shall be 2 inches by the depth of the asphalt concrete paving; minimum size shall be 2 inches by 4 inches. Wood shall be Douglas fir No. 1. Wood shall comply with Section 57 of the Caltrans Standard Specifications.

## 2.08 PAINT FOR TRAFFIC AND PARKING LOT STRIPING AND MARKING

Paint shall be per City of Santa Maria Standard Specifications for pavement in City Right of Way and shall be per Caltrans Standard Specifications for pavement in Caltrans Right of Way.

## 2.09 PAVEMENT MARKERS

Markers shall be per City of Santa Maria Standard Specifications for pavement in City Right of Way and shall be per Caltrans Standard Specifications for pavement in Caltrans Right of Way.



## 2.10 PAINT FOR TRAFFIC STRIPING AND MARKING

Paint shall be per City of Santa Maria Standard Specifications for pavement in City Right of Way and shall be per Caltrans Standard Specifications for pavement in Caltrans Right of Way.

## PART 3- EXECUTION

### 3.01 PAVEMENT REMOVAL

- A. Initially cut asphalt concrete pavement with pneumatic pavement cutter or other equipment at the limits of the excavation and remove the pavement. After backfilling the excavation, saw cut asphalt concrete pavement to a minimum depth of 2 inches at a point not less than 9 inches outside the limits of the excavation or the previous pavement cut, whichever is greater, and remove the additional pavement.
- B. Saw cut concrete pavement, including cross gutters, curbs and gutters, sidewalks, and driveways, to a minimum depth of 1 1/2 inches at a point 1 foot beyond the edge of the excavation and remove the pavement. The concrete pavement may initially be cut at the limits of the excavation by other methods prior to removal and the saw cut made after backfilling the excavation. If the saw cut falls within 3 feet of a concrete joint or pavement edge, remove the concrete to the joint or edge.
- C. Make arrangements for and dispose of the removed pavement.
- D. Final pavement saw cuts shall be straight along both sides of trenches, parallel to the pipeline alignment, and provide clean, solid, vertical faces free from loose material. Saw cut and remove damaged or disturbed adjoining pavement. Saw cuts shall be parallel to the pipeline alignment or the roadway centerline or perpendicular to same.

### 3.02 PAVEMENT REPLACEMENT

- A. Backfill, compaction, and the permanent paving, except for the final asphalt surface course, shall be complete at all times to a point not to exceed 1,300 feet behind any working heading. Do not place final surface course until at least three months after traffic has been returned to that portion of the street. Place temporary striping after the base course of A.C. pavement has been completed in the same configuration as the existing permanent striping so that traffic can be returned to normal patterns. This striping shall be considered temporary and is the Contractor's responsibility to place and maintain.
- B. The pavement replacement shall be shown on the plans.

### 3.03 INSTALLATION

Producing, hauling, placing, compacting, and finishing of asphalt concrete shall conform to Section 39 of the Caltrans Standard Specifications. Apply seal coat to all paving except open asphalt concrete.

### 3.04 CONNECTIONS WITH EXISTING PAVEMENT

Where new paving joins existing paving, chip the existing surfaces 12 inches back from the joint line so that there will be sufficient depth to provide a minimum of 1 inch of asphalt concrete. Dispose of waste material offsite. Tack chipped areas prior to placing the asphalt concrete. Meet lines shall be straight and the edges vertical. Paint the edges of meet line cuts with liquid asphalt or emulsified asphalt prior to placing asphalt concrete. After placing the asphalt concrete, seal the meet line by painting with liquid asphalt or emulsified asphalt and then immediately cover with clean, dry sand.

### 3.05 PREPARATION OF SUBGRADE

- A. Excavate and shape subgrade to line, grade, and cross section shown in the drawings. The subgrade shall be considered to extend over the full width of the base course.
- B. Scarify and cultivate the top 12 inches of subgrade when the subgrade consists of dry soils which are impervious to the penetration of water, soils which contain excessive amounts of moisture which may result in unstable foundations, soils which are nonuniform in character which may result in nonuniform relative compactions and subsequent differential settlements of finished surfaces, or when pavement is to be placed directly on the roadbed material.
- C. Remove soft material disclosed by the subgrade preparation, replace with aggregate base course material, and recompact.
- D. Compact the top 12 inches of subgrade to 95% relative compaction.
- E. The finished subgrade shall be within a tolerance of  $\pm 0.08$  of a foot of the grade and cross-section shown and shall be smooth and free from irregularities and at the specified relative compaction.

### 3.06 INSTALLING WOOD HEADERS

Provide wood header at edges of paving except where paving is adjacent to concrete slabs, gutters, walks, existing paving, or structures.

### 3.07 PLACING AGGREGATE BASE COURSE

Place aggregate base course to a minimum thickness of 12 inches, unless shown otherwise in the drawings. Compact to 95% relative compaction. Install in accordance with Section 26 of the Caltrans Standard Specifications.

### 3.08 COMPACTION OF AGGREGATE BASE AND LEVELING COURSES

Compaction and rolling shall begin at the outer edges of the surfacing and continue toward the center. Apply water uniformly throughout the material to provide moisture for obtaining the specified compaction. Compact each layer to the specified relative compaction before placing the next layer.

### 3.09 PLACING TACK COAT

Apply tack coat on surfaces to receive finish pavement per Section 39-4.02 in the Caltrans Standard Specifications.

### 3.10 PLACING ASPHALT PAVING

Place asphalt paving at a minimum thickness to match existing asphalt paving thickness unless otherwise shown in the drawings. Install in accordance with Section 39-6 in the Caltrans Standard Specifications.

### 3.11 COMPACTION OF ASPHALT CONCRETE PAVING

Compact until roller marks are eliminated and a density of 92% minimum to 98% maximum has been attained per ASTM D2041.

### 3.12 APPLYING SEAL COAT

Apply fog-type seal coat at the rate of 0.05 to 0.10 gallon per square yard or slurry seal coat at the rate of 10 to 15 pounds of dry aggregate per square yard.

### 3.13 SURFACE TOLERANCE

- A. Finished grade shall not deviate more than 0.02 foot in elevation from the grade indicated in the drawings. Slopes shall not vary more than 1/4 inch in 10 feet from the slopes shown in the drawings.
- B. After paving has been installed and compacted, spray water over the entire paved area. Correct any areas where water collects and does not drain away.

### 3.14 APPLYING PAINT FOR TRAFFIC AND PARKING LOT STRIPING AND MARKING

Apply in accordance with Section 84 of the Caltrans Standard Specifications.

END OF SECTION

## SECTION 330130 LEAKAGE AND INFILTRATION TESTING

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes testing of gravity pipelines, sewers, culverts, drains, and manholes not intended to be pressurized in excess of 5 psi or 12 feet head of water. Leakage test is by internal air pressure or water. Infiltration test is by measurement of rate of flow of water.

### PART 2- MATERIALS

#### 2.01 TEST PLUGS

Inflatable and expandable type, braced to contain 5 psi over the pipe cross-section area.

#### 2.02 PRESSURE-RELIEF VALVE

Set to limit the internal pipe test pressure to 5 psi.

### PART 3- EXECUTION

#### 3.01 SELECTION OF ALTERNATE TEST CRITERIA

- A. When more than one pipe size is included in a test section, determine the test time by the criteria of ASTM F1417 for plastic pipe.
- B. If the entire test section is submerged in groundwater, test for infiltration only.

#### 3.02 PREPARATION OF THE PIPELINE

- A. Prior to testing, flush and clean the pipeline to wet the pipe surface and clean out debris.
- B. Plug pipe outlets, including stoppers in laterals, to resist the leakage test pressure.

#### 3.03 LEAKAGE TEST

- A. Test for leakage or for infiltration by means of an air test or a water test. Test each section of pipe between manholes, along with the manholes. Use the air test where the difference in elevation between the invert of the upper structure and the invert of the lower structure is more than 10 feet.

- B. Test each section of pipe subsequent to the last backfill compacting operation.

3.04 WATER TEST

- A. Test each section of pipe between two successive structures by closing the lower end of the pipe to be tested and the inlet pipe of the upper structure with plugs or stoppers. Fill the pipe and structure with water to a point 4 feet above the invert of the open pipe in the upper structure or to a height of 10 feet above the invert of the sewer in the lower structure, whichever gives the least hydrostatic pressure on the lower structure.
- B. The total leakage shall be the decrease in volume of water in the upper structure. The leakage shall not exceed 0.025 gpm per inch of nominal diameter of pipe per 1,000 feet of pipe being tested. Do not use the length of lateral connections in computing the length of pipe being tested.
- C. If the leakage is greater than allowed, overhaul the pipe and, if necessary, replace and re-lay until the joints and pipe comply with this test. Complete tests before trench is paved.

3.05 AIR TEST

- A. Conduct air tests per the following standards:

Pipe Material	Specification Section	ASTM Specification
PVC	333112	F1417, Table 1

- B. Test each section of pipe between two successive manholes by plugging pipe outlets with test plugs. Add air slowly until the internal pressure is raised to 4.0 psig. The compressor used to add air to the pipe shall have a blowoff valve set at 5 psig so that the internal pressure in the pipe never exceeds 5 psig. Maintain the internal pressure of 4 psig for at least two minutes to allow the air temperature to stabilize, then disconnect the air supply and allow the pressure to decrease to 3.5 psig. Measure the time in minutes that is required for the internal air pressure to drop from 3.5 psig to 2.5 psig. Compare the results with the values tabulated in the referenced ASTM specifications in paragraph A above.
- C. If the pressure drops from 3.5 psig to 2.5 psig occurs in less time than the specified values, overhaul the pipe and, if necessary, replace and re-lay the pipe until the joints and pipe hold satisfactorily under this test.
- D. Guard against the sudden expulsion of a poorly installed plug or a plug that is partially deflated.

### 3.06 TEST FOR INFILTRATION

- A. If, in the construction of a section of the sewer between structures, excessive groundwater is encountered, close the end of the pipe at the upper structure sufficiently to prevent the entrance of water. Discontinue pumping groundwater for at least three days. Then test the section for infiltration. The infiltration shall not exceed 0.025 gpm per inch of diameter per 1,000 feet of main line pipe being tested as measured at the downstream structure. Do not include the length of house laterals entering that section. Test period shall be at least eight hours.
- B. Where infiltration exceeds the maximum acceptable, immediately uncover the pipe and reduce the infiltration to within the maximum acceptable by replacing, re-laying, or encasing the pipe in concrete.

### 3.07 CORRECTION OF OBSERVED LEAKS

Even if the infiltration is less than the maximum acceptable, stop any individual leaks that may be observed.

END OF SECTION

## SECTION 333112 PVC GRAVITY SEWER PIPE

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, installation, and testing of PVC gravity sewer pipe conforming to ASTM D3034 and F679.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Precast Circular Concrete Manholes: 034210.
- B. Trenching, Backfilling, and Compacting: 312316.
- C. Leakage and Infiltration Testing: 330130.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit reports on testing per ASTM D3034, ASTM D3212, ASTM F679 and ASTM F477.
- C. Submit copies of delivery slips for all materials specified in this section.

### PART 2- MATERIALS

#### 2.01 PVC MATERIAL

Additives and fillers, including stabilizers, antioxidants, lubricants, colorants, etc., shall not exceed 10 parts by weight per 100 of PVC resin in the compound.

#### 2.02 JOINTS

Provide elastomeric gasket joints of the push-on type, conforming to ASTM D3212.

#### 2.03 GASKETS

Gaskets for push-on joints shall conform to ASTM F477.

#### 2.04 FITTINGS

- A. Fittings for pipe 4 through 15 inches shall conform to ASTM D3034, SDR 35.

2.05 MANDREL FOR FIELD TESTING OF PIPE DEFLECTION

The mandrel shall:

- A. Be a rigid, nonadjustable, odd-numbering-leg (six legs minimum) mandrel having an effective length not less than its nominal diameter.
- B. Have a minimum diameter at any point along the full length as follows:

<b>Pipe Material</b>	<b>Nominal Size (inches)</b>	<b>Minimum Mandrel Diameter (inches)</b>
PVC-ASTM D3034 (SDR 35)	8	7.09

- C. Be fabricated of steel; be fitted with pulling rings at each end; be stamped or engraved on some segment other than a runner indicating the pipe material specification, nominal size, and mandrel outside diameter (e.g., PVC, D 3034-8"-7.524"); and be furnished in a carrying case labeled with the same data as stamped or engraved on the mandrel.
- D. All costs incurred by the Contractor attributable to mandrel and deflection testing, including any delays, shall be borne by the Contractor at no cost to the Owner.

PART 3- EXECUTION

3.01 INSTALLING PVC SEWER PIPE

- A. Install in accordance with Section 312316, ASTM D2321, and as described below.
- B. Pipe shall not deviate more than 1 inch from line or 1/4 inch from grade. Measure at the pipe invert.
- C. Minimum bedding thickness shall be as specified in drawings details.
- D. Lay pipe without break, upgrade from structure to structure, with the socket ends of the pipe upgrade.
- E. Do not use the pipe as a drain for removing water that has infiltrated into the trench.
- F. After joint assembly, bring the bedding material up to pipe spring line. Bedding material shall be imported sand per Section 312316. Place the bedding material on each side of the pipe. Tamp the bedding material into final position at pipe



spring line and continue to the top of the pipe. Relative compaction shall be in conformance with Section 312316.

- G. Place bedding material to 1 foot above the top of the pipe and compact to the same relative compaction as in the pipe zone per Section 312316. The remainder of the trench backfill shall be native material, installed per Section 312316.
- H. Do not use hydro-hammers to compact bedding or backfill.

### 3.02 INSTALLING PIPE AT MANHOLES AND STRUCTURES

- A. Unless otherwise shown on the drawings, place a 2-foot PVC length of pipe of the same inside diameter as the adjoining pipe at the inlet and outlet to each manhole or structure. Use one of the following methods:
  - 1. Directly cast a manhole coupling into the manhole base. Provide rubber-ring gasket in the coupling.
  - 2. Stretch a rubber-ring gasket around the pipe to serve as a water stop when cast into the structure wall.
- B. Do not cast pipe bells into manholes or structures. Cut off the bell so that no recess or offset appears on the exposed face from the inside wall of the pipe to the outside wall of the pipe. The pipe shall have a plain end, flush with the inside wall of the manhole or structure, or as shown in the drawings.

### 3.03 TESTING FOR DEFECTS OF INSTALLED PIPE

Following placement and compaction of backfill and prior to placing permanent pavement, ball and mandrel the pipe to measure for obstructions (excessive deflections, joint offsets, and lateral pipe intrusions).

### 3.04 FIELD TESTING FOR PIPE DEFLECTION

- A. Test installed pipe to ensure that vertical deflections for plastic pipe do not exceed the maximum allowable deflection. Maximum allowable deflections shall be governed by the mandrel requirements stated in Part 2.
- B. Perform deflection tests after completion of placement and compaction of backfill. Clean and inspect the pipe for offsets and obstructions prior to testing.
- C. Pull a mandrel through the pipe by hand to verify that maximum allowable deflections have not been exceeded. Prior to use, the mandrel shall be certified by an independent testing laboratory. Use of an uncertified mandrel or a mandrel altered or modified after certification will invalidate test. If the mandrel fails to pass, the pipe will be deemed to be overdeflected.

- D. Uncover any overdeflected pipe and, if not damaged, reinstall. Remove damaged pipe from the site. Any pipe subjected to any method or process other than removal, which attempts, even successfully, to reduce or cure any overdeflection, shall be uncovered, removed from the site, and replaced with new pipe.

3.05 LEAKAGE TEST

See Section 330130.

3.06 TESTING FOR ALIGNMENT AND GRADE

After the pipe has been installed, tested for leakage, backfilled to existing grade, and manholes raised to grade and resurfaced, "ball" the pipe from manhole to manhole with a sewer scrubbing ball. After balling the pipe, test the pipe for deflection using a mandrel.

END OF SECTION

## SECTION 400500 GENERAL PIPING REQUIREMENTS

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section describes the general requirements for selecting piping materials; selecting the associated bolts, nuts, and gaskets for flanges for the various piping services in the project; and miscellaneous piping items.

#### 1.02 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit affidavit of compliance with referenced standards (e.g., AWWA, ANSI, ASTM, etc.).
- C. Submit certified copies of mill test reports for bolts and nuts, including coatings if specified. Provide recertification by an independent domestic testing laboratory for materials originating outside of the United States.
- D. Submit manufacturer's data sheet for gaskets supplied showing dimensions and bolting recommendations.

#### 1.03 DEFINITIONS OF BURIED AND EXPOSED PIPING

- A. Buried piping is piping buried in the soil, commencing at the wall or beneath the slab of a structure. Where a coating is specified, provide the coating up to the structure wall. Unless detailed otherwise, coating shall penetrate wall no less than 1 inch. Piping encased in concrete is considered to be buried. Do not coat encased pipe.
- B. Exposed piping is piping in any of the following conditions or locations:
  - 1. Inside buildings, vaults, or other structures.

#### 1.04 PIPING SERVICE

Piping service is determined by the fluid conveyed, regardless of the pipe designation. For example, pipes designated "Air Low Pressure," "Air High Pressure," and "Air" are all considered to be in air service.

## PART 2- MATERIALS

### 2.01 THREAD FORMING FOR STAINLESS STEEL BOLTS

Form threads by means of rolling, not cutting or grinding.

### 2.02 BOLTS AND NUTS FOR FLANGES FOR STEEL AND DUCTILE-IRON PIPING

- A. Bolts and nuts for buried or submerged Class 125 or 150 flanges and Class 125 or 150 flanges located outdoors above ground or in vaults and structures shall be Type 316 stainless steel conforming to ASTM A193, Grade B8M for bolts and ASTM A194, Grade 8M for nuts
- B. Provide washers for each nut. Washers shall be of the same material as the nuts.

### 2.03 LUBRICANT FOR STAINLESS STEEL BOLTS AND NUTS

Lubricant shall be chloride free and shall be Ramco TG-50, Ramco Anti-Seize, Husk-Itt Corporation Husky™ Lube O'Seal, or equal.

### 2.04 GASKETS FOR FLANGES FOR DUCTILE-IRON PIPING AND FITTINGS IN RAW SEWAGE SERVICE

Gaskets shall be full face, 1/8-inch thick, Buna-N having a hardness of 55 to 65 durometer. Gaskets shall be suitable for a water pressure of 200 psi at a temperature of 250°F. Gaskets shall have "nominal" pipe size inside diameters not the inside diameters per ASME B16.21. Provide Garlock Style 9122 or equal.

## PART 3 - EXECUTION

### 3.01 INSTALLING PIPE SPOOLS IN CONCRETE

Install pipes in walls and slabs before placing concrete. See Sections 030500 .

### 3.02 RAISED FACE AND FLAT FACE FLANGES

Where a raised face flange connects to a flat-faced flange, remove the raised face of the flange.

### 3.03 INSTALLING ABOVEGROUND OR EXPOSED PIPING

- A. Provide pipe supports as detailed in the drawings.
- B. Install pipe without springing, forcing, or stressing the pipe or any adjacent connecting valves or equipment.

### 3.04 INSTALLING FLANGED PIPING

- A. Set pipe with the flange bolt holes straddling the pipe horizontal and vertical centerline. Install pipe without springing, forcing, or stressing the pipe or any adjacent connecting valves or equipment. Before bolting up, align flange faces to the design plane within 1/16 inch per foot measured across any diameter. Align flange bolt holes within 1/8 inch maximum offset.
- B. Inspect each gasket to verify that it is the correct size, material, and type for the specified service and that it is clean and undamaged. Examine bolts or studs, nuts, and washers for defects such as burrs or cracks and rust and replace as needed.
- C. Clean flanges by wire brushing before installing flanged fittings. Clean flange bolts and nuts by wire brushing, lubricate carbon steel bolts with oil and graphite, and tighten nuts uniformly and progressively.
- D. Bolt lengths shall extend completely through their nuts. Any that fail to do so shall be considered acceptably engaged if the lack of complete engagement is not more than one thread.
- E. Do not use more than one gasket between contact faces in assembling a flanged joint.
- F. Tighten the bolts to the manufacturer's specifications, using the recommended cross bolt pattern in multiple steps of increasing torque, until the final torque requirements are achieved. Do not over torque.
- G. If flanges leak under pressure testing, loosen or remove the nuts and bolts, reset or replace the gasket, reinstall or retighten the bolts and nuts, and retest the joints. Joints shall be watertight.

### 3.05 INSTALLING BLIND FLANGES

- A. At outlets not indicated to be connected to valves or to other pipes and to complete the installed pipeline hydrostatic test, provide blind flanges with bolts, nuts, and gaskets.
- B. Coat the inside face of blind flanges per Section 099000, System No. 6A.

### 3.06 INSTALLATION OF STAINLESS STEEL BOLTS AND NUTS

- A. Prior to assembly, coat threaded portions of stainless steel bolts and nuts with lubricant.

END OF SECTION

## SECTION 400515 PRESSURE TESTING OF PIPING

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section specifies the cleaning and hydrostatic and leakage testing of pressure piping for raw sewage force mains.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Leakage and Infiltration Testing: 330130.
- B. Manual, Check, and Process Valves: 400520.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit test bulkhead locations and design calculations, pipe attachment details, and methods to prevent excessive pipe wall stresses.
- C. Submit six (6) copies of the test records to the Owner's Representative upon completion of the testing.

#### 1.04 TEST PRESSURES

Test pressures for the various services and types of piping are shown in the subsection on "Test Pressure and Test Fluids" in Part 3.

#### 1.05 TESTING RECORDS

Provide records of each piping installation during the testing. These records shall include:

- A. Date and times of test.
- B. Identification of pipeline, or pipeline section tested or retested.
- C. Identification of pipeline material.
- D. Identification of pipe specification.
- E. Test fluid.
- F. Test pressure at low point in pipeline, or pipeline section.

- G. Remarks: Leaks identified (type and location), types of repairs, or corrections made.
- H. Certification by Contractor that the leakage rate measured conformed to the specifications.

## PART 2- MATERIALS

### 2.01 MANUAL AIR-RELEASE VALVES FOR BURIED PIPING

Provide temporary manual air-release valves for pipeline testing. Construct the pipe outlet in the same manner as for a permanent air valve and after use, seal with a blind flange, pipe cap, or plug and coat the same as the adjacent pipe.

### 2.02 TEST BULKHEADS

Design and fabricate test bulkheads per Section VIII of the ASME Boiler and Pressure Vessel Code. Materials shall comply with Part UCS of said code. Design pressure shall be at least 2.0 times the specified test pressure for the section of pipe containing the bulkhead. Limit stresses to 70% of yield strength of the bulkhead material at the bulkhead design pressure. Include air-release and water drainage connections.

### 2.03 TESTING FLUID

- A. Testing fluid shall be water.
- B. Submit request for use of water from waterlines of Owner 48 hours in advance.
- C. The Contractor may obtain the water from the Owner at no charge.

### 2.04 TESTING EQUIPMENT

Provide calibrated pressure gauges, pipes, bulkheads, pumps, chart recorder, and meters to perform the hydrostatic testing.

## PART 3- EXECUTION

### 3.01 TESTING PREPARATION

- A. Pipes shall be in place, backfilled, and anchored before commencing pressure testing.
- B. For buried piping, the pipe may be partially backfilled and the joints left exposed for inspection during an initial leakage test. Perform the final pressure test, however, after completely backfilling and compacting the trench.

- C. Provide any temporary piping needed to carry the test fluid to the piping that is to be tested. After the test has been completed and demonstrated to comply with the specifications, disconnect and remove temporary piping. Do not remove exposed vent and drain valves at the high and low points in the tested piping; remove any temporary buried valves and cap the associated outlets. Plug taps or connections to the existing piping from which the test fluid was obtained.
- D. Provide temporary drain lines needed to carry testing fluid away from the pipe being tested. Remove such temporary drain lines after completing the pressure testing. Pipes shall remain full after testing.
- E. Prior to starting the test, the Contractor shall notify the Owner's Representative.

### 3.02 CLEANING

- A. Before conducting hydrostatic tests, flush pipes with water to remove dirt and debris. Maintain a flushing velocity of at least 3 fps for water testing. Flush pipes for time period as given by the formula

$$T = \frac{2L}{3}$$

in which:

T = flushing time (seconds)  
L = pipe length (feet)

### 3.03 INITIAL PIPELINE FILLING FOR HYDROSTATIC TESTING

Maximum rate of filling shall not cause water velocity in pipeline to exceed 1 fps. Filling may be facilitated by removing automatic air valves and releasing air manually.

### 3.04 HYDROSTATIC TESTING OF BURIED PIPING

- A. Where any section of the piping contains concrete thrust blocks or encasement, do not perform the pressure test until at least ten (10) days after placing the concrete. When testing mortar-lined or PVC piping, fill the pipe to be tested with water and allow it to soak for at least 48 hours to absorb water before conducting the pressure test.
- B. Apply and maintain the test pressure by means of a positive displacement hydraulic force pump.
- C. Maintain the test pressure for the following duration by restoring it whenever it falls an amount of 5 psi:



<b>Pipe Diameter (inches)</b>	<b>Hours</b>
4 and less	4

- D. After the test pressure is reached, use a meter to measure the additional water added to maintain the pressure. This amount of water is the loss due to leakage in the piping system. The allowable leakage volume is defined by the formula

$$L = \frac{HND(P)^{1/2}}{C}$$

in which:

- L = allowable leakage (gallons)
- H = specified test period (hours)
- N = number of rubber-gasketed joints in the pipe tested
- D = diameter of the pipe (inches)
- P = specified test pressure (psig)
- C = 7,400

- E. The allowable leakage for buried piping having threaded, brazed, or welded (including solvent welded) joints shall be zero.
- F. Repair and retest any pipes showing leakage rates greater than that allowed in the above criteria.

### 3.05 REPETITION OF TEST

If the actual leakage exceeds the allowable, locate and correct the faulty work and repeat the test. Restore the work and all damage resulting from the leak and its repair. Eliminate visible leakage.

### 3.06 BULKHEAD AND TEST FACILITY REMOVAL

After a satisfactory test, remove the testing fluid, remove test bulkheads and other test facilities, and restore the pipe coatings.

### 3.07 TEST PRESSURE AND TEST FLUIDS

- A. Testing and design pressures (psig) shall be as listed below:

<b>Pipe Service</b>	<b>Pipe Material</b>	<b>Test Pressure (psig)</b>
Sewer Lift Station	Ductile Iron	100
Force- Main	PVC	100

END OF SECTION

## SECTION 400520 MANUAL, CHECK, AND PROCESS VALVES

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, testing, and installation of manually operated valves, check valves, and process valves including eccentric plug valves.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Painting and Coating: 099000.
- B. General Piping Requirements: 400500.
- C. Pressure Testing of Piping: 400515.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit manufacturer's catalog data and detail construction sheets showing all valve parts. Describe each part by material of construction, specification (such as AISI, ASTM, SAE, or CDA), and grade or type.
- C. Show valve dimensions including laying lengths. Show port sizes. Show dimensions and orientation of valve actuators, as installed on the valves. Show location of internal stops for gear actuators. State differential pressure and fluid velocity used to size actuators. For worm-gear actuators, state the radius of the gear sector in contact with the worm and state the handwheel diameter.
- D. Show valve linings and coatings. Submit manufacturer's catalog data and descriptive literature.
- E. Submit six copies of a report verifying that the valve interior linings and exterior coatings have been tested for holidays and lining thickness. Describe test results and repair procedures for each valve. Do not ship valves to project site until the reports have been returned by the Owner's Representative and marked "Resubmittal not required."
- F. For butterfly and eccentric plug valves, show the clear diameter or size of the port. Show the actual area of the port as a percentage of the area as calculated for the nominal valve size.

1.04 PROOF OF DESIGN TEST FOR ECCENTRIC PLUG VALVES

- A. The Contractor shall require the valve manufacturer to furnish six certified copies of reports covering the design tests for the eccentric plug valves as described in AWWA C517 and the following. One prototype valve of each size and class of a manufacturer's design shall be tested for leakage at the specified design pressure and hydrostatically tested with twice the specified design pressure. The hydrostatic test shall be performed with the plug in the open position. The leakage test shall be performed with the plug in the closed position. The duration of each test shall be 10 minutes minimum. During the leakage test, there shall be no indication of leakage past the valve plug. Valves specified to have bi-directional seats shall be leak tight in both directions. In the case of flanged valves, the valve body shall be bolted to a flanged test head.
- B. No part of the valve or plug shall be permanently deformed by the hydrostatic test. During the hydrostatic test, there shall be no leakage through the metal, the end joints, or the shaft seal.
- C. It is the intent that the valve manufacturer provide evidence of the adequacy of each type offered to perform under design pressures within the applicable rating for a sufficient number of test cycles simulating a full service life. The adequacy is to be proven by tests, made on one or more valves selected to represent each basic type of seat design of a size within each applicable group, in a pressure class or classes equal to or greater than that specified. The required number of test cycles appears in the following table:

<b>TEST CYCLES REQUIRED</b>		
<b>Size Group (inches)</b>	<b>No. of Cycles</b>	<b>Minimum Differential Pressure (psig)</b>
4	10,000	150

Every test cycle shall consist of applying the specified differential pressure to the plug in the closed position, then opening the plug (which will relieve the pressure) to the wide-open position and then closing the plug.

- D. The valve shall be leak tight under the specified pressure differential upon completion of the cycle test without having to stop during the test to repair the valve, modify or reinforce the seat, or install shims or wedges around the seat.
- E. The plug shall not be rotated past the center position to jam the plug onto the seat during the hydrostatic test, the leakage test, or the cycle test.

## PART 2- MATERIALS

### 2.01 GENERAL

- A. Install valves complete with operating handwheels or levers, chainwheels, extension stems, floor stands, gear actuators, operating nuts, chains, and wrenches required for operation.
- B. Valves shall have the name of the manufacturer and the size of the valve cast or molded onto the valve body or bonnet or shown on a permanently attached plate.

### 2.02 VALVE ACTUATORS

- A. Provide lever or wrench actuators for exposed valves 6 inches and smaller.

### 2.03 BOLTS AND NUTS FOR FLANGED VALVES

Bolts and nuts for flanged valves shall be as described in Section 400500.

### 2.04 GASKETS FOR FLANGES

Gaskets for flanged end valves shall be as described in Section 400500.

### 2.05 PAINTING AND COATING

- A. Coat exterior surfaces of metal valves located above ground or in vaults and structures in accordance with Section 099000, System No. 10. Apply the specified prime and finish coat at the place of manufacture. Finish coat shall match the color of the adjacent piping. Coat handwheels the same as the valves.
- B. Line the interior metal parts of metal valves 4 inches and larger, excluding seating areas and bronze and stainless steel pieces, per Section 099000, System No. 1. Apply lining at the place of manufacture.
- C. Test the valve interior linings and exterior coatings at the factory with a low-voltage holiday detector, using a sponge saturated with a 0.5% sodium chloride solution. The lining shall be holiday free.
- D. Measure the thickness of the valve interior linings per Section 099000. Repair areas having insufficient film thickness per Section 099000.

### 2.06 PACKING, O-RINGS, AND GASKETS

Unless otherwise stated in the detailed valve specifications, packing, O-rings, and gaskets shall be one of the following non-asbestos materials:

- A. Teflon.

- B. Kevlar aramid fiber.
- C. Acrylic or aramid fiber bound by nitrile. Products: Garlock "Bluegard," Klinger "Klingersil C4400," or equal.
- D. Buna-N (nitrile).

## 2.07 RUBBER SEATS

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.

## 2.08 VALVES

### A. Plug Valves:

#### 1. Plug and Seating Design for Eccentric Plug Valves:

- a. Eccentric plug valves shall comply with AWWA C517 and the following. Provide Rectangular or circular plug design, with an associated rectangular or round seat. Provide bidirectional seating design. The valve shall seat with the rated pressure both upstream and downstream of the closed plug. Provide geared actuators sized for bidirectional operation.
- b. The metallic portion of the plug shall be one-piece design and shall be without external reinforcing ribs which result in there being a space between the rib and the main body of the plug through which water can pass. Nowhere in the valve or actuators shall the valve shaft be exposed to iron on iron contact. Sleeve bearings shall be stainless steel in valve sizes 20 inches and smaller and bronze or stainless steel in valve sizes 24 inches and larger. Provide enclosed worm-gear actuators for valves 6 inches and larger.
- c. Rubber compounds shall have less than 2% volume increase when tested in accordance with ASTM D471 after being immersed in distilled water at a temperature of 73.4°F ±2°F for 70 hours.

#### 2. 100% Port Area Eccentric Plug Valves:

- a. Eccentric plug valves shall be nonlubricated type. Minimum Pressure rating shall be 175 psi. Bodies shall be cast iron per ASTM A126, Class B. Ends shall be flanged, Class 125 per ASME B16.1. Plugs shall be cast iron (ASTM A126, Class B), or ductile iron (ASTM A536, Grade 65-45-12) with Buna-N or neoprene facing. Design plugs to seat over a pressure range of 1 psi to the valve design pressure rating. Valve body seats shall be Type 304 or 316 stainless steel or

have a raised welded-in overlay at least 1/8 inch thick of not less than 90% nickel. Body cap screws and bolts and nuts shall be Type 316 stainless steel. Packing shall be butadiene-filled Teflon. Alternatively, U-cup seals may be provided. Provide 100% port area. Valves shall be DeZurik Figure 118 PEC or PEF, Clow F-5412, Val-Matic “Cam-Centric”, Milliken “Millcentric”, or equal.

B. Check Valves:

1. Cast-Iron Swing Check Valves 4 Inches, Class 125:

Swing check valves, 4 inches, shall be iron body, bronze mounted complying with AWWA C508 with the following materials of construction:

Description	Material	Specification
Disc or clapper seat ring and valve body seat ring	Bronze or brass	ASTM B62 or B584 (Alloy C84400 or C87600)
Body and cap (bonnet)	Cast iron	ASTM A126, Class B
Disc and hinge or arm (valves 4 inches and smaller)	Bronze	ASTM B62 or ASTM B584 (Alloy C84400)
Disc and hinge or arm (valves larger than 4 inches)	Cast iron or bronze	ASTM A126, Class B; ASTM B62.
Hinge pin	Stainless steel	Type 303, 304, or 410 stainless
Cover bolts and nuts	Stainless steel	ASTM A193, Grade B8M; ASTM A194, Grade 8M
Internal fasteners and accessories	Bronze or Type 304 or 316 stainless steel	

Bronze or brass components in contact with water shall comply with the following requirements:

Constituent	Content
Zinc	7% maximum
Aluminum	2% maximum
Lead	8% maximum
Copper + Nickel + Silicon	83% minimum

Ends shall be flanged, Class 125, ASME B16.1. Minimum valve working pressure shall be 150 psi. Provide check valves with outside lever and spring.

The shop drawing submittal shall include a detail showing how the hinge pin extends through the valve body. Show packing gland, hinge pin gland, cap, and other pieces utilized.

Valves shall be M&H Style 259-02, Clow 1106SL, or equal.

## PART 3- EXECUTION

### 3.01 VALVE SHIPMENT AND STORAGE

- A. Provide flanged openings with metal closures at least 3/16-inch thick, with elastomer gaskets and at least four full-diameter bolts. Install closures at the place of valve manufacture prior to shipping. For studed openings, use all the nuts needed for the intended service to secure closures. Alternatively, ship flanged valves 3 inches and smaller in separate sealed cartons or boxes.
- B. Provide threaded openings with steel caps or solid-shank steel plugs. Do not use nonmetallic (such as plastic) plugs or caps. Install caps or plugs at the place of valve manufacture prior to shipping. Alternatively, ship valves having threaded openings or end connections in separate sealed cartons or boxes.
- C. Store resilient seated valves in sealed polyethylene plastic enclosures with a minimum of one package of desiccant inside. Store resilient seated valves in the open or unseated position. Valves with adjustable packing glands shall have the packing gland loosened prior to storage. Inspect valves at least once per week, replace desiccant if required and repair damaged storage enclosures. Do not store valves with resilient seats near electric motors or other electrical equipment.
- D. Inspect valves on receipt for damage in shipment and conformance with quantity and description on the shipping notice and order. Unload valves carefully to the ground without dropping. Use forklifts or slings under skids. Do not lift valves with slings or chain around operating shaft, actuator, or through waterway. Lift valves with eyebolts or rods through flange holes or chain hooks at ends of valve parts.
- E. Protect the valve and actuators from weather and the accumulation of dirt, rocks, and debris. Do not expose rubber seats to sunlight or ozone for more than 30 days. Also, see the manufacturer's specific storage instructions.
- F. Make sure flange faces, joint sealing surfaces, body seats, and disc seats are clean. Check the bolting attaching the actuator to the valve for loosening in transit and handling. If loose, tighten firmly. Open and close valves having



manual or power actuators to make sure the valve operates properly and that stops or limit switches are correctly set so that the valve seats fully. Close valve before installing.

### 3.02 FACTORY PRESSURE TESTING

- A. Hydrostatically test the valve pressure-containing parts at the factory per the valve specification or per the referenced standard. If no testing requirement is otherwise specified or described in the referenced standards, then test 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, then provide an additional operational test and verify that the valve components function.
- B. The chloride content of liquids used to test austenitic stainless steel materials shall not exceed 50 ppm. To prevent deposition of chlorides as a result of evaporative drying, remove residual liquid from tested parts at the conclusion of the test.

### 3.03 INSTALLING VALVES—GENERAL

- A. Remove covers over flanged openings and plugs from threaded openings, after valves have been placed at the point to which the valves will be connected to the adjacent piping. Do not remove valves from storage cartons or boxes until they are ready to be installed.
- B. Handle valves carefully when positioning, avoiding contact or impact with other equipment, vault or building walls, or trench walls.
- C. Clean valve interiors and adjacent piping of foreign material prior to making up valve to pipe joint connection. Prepare pipe ends and install valves in accordance with the pipe manufacturer's instructions for the joint used. Do not deflect pipe-valve joint. Do not use a valve as a jack to pull pipe into alignment. The installation procedure shall not result in bending of the valve/pipe connection with pipe loading.
- D. Make sure valve ends and seats are clean. Check exposed bolting for loosening in transit and handling and tighten to manufacturer's recommendations. Open and close the valve to make sure it operates properly and that stops or limit switches are correctly set so that the vane, ball, gate, needle, diaphragm, disc, plug, or other seating element seats fully. Close the valve before installing. Check coatings for damage and repair. Handle valves carefully when positioning, avoiding contact or impact with other equipment or structures.
- E. Prior to assembly, coat threaded portions of stainless steel bolts and nuts with lubricant.

### 3.04 INSTALLING EXPOSED VALVES

- A. Unless otherwise indicated in the drawings, install valves in horizontal runs of pipe having centerline elevations 4 feet 6 inches or less above the floor with their operating stems vertical. Install valves in horizontal runs of pipe having centerline elevations between 4 feet 6 inches and 6 feet 9 inches above the floor with their operating stems horizontal.
- B. Install valves on vertical runs of pipe that are next to walls with their stems horizontal, away from the wall. Valves on vertical runs of pipe that are not located next to walls shall be installed with their stems horizontal, oriented to facilitate valve operation.

### 3.05 INSTALLING ECCENTRIC PLUG VALVES

- A. Unload, store, and install in accordance with AWWA C517, Appendix A and the following. Unload valves carefully to the ground without dropping. On valves larger than 12 inches, use forklifts or slings under skids. On smaller valves, do not lift valves with slings or chain around actuator or through waterway. Lift these valves with eyebolts or rods through flange holes or chain hooks at the ends of valve parts. If it is not practical to store the valve indoors, protect the valve and actuators from weather and the accumulation of dirt, rocks, and debris.
- B. Install such that the rotation of the plug is about a horizontal axis. Install such that the plug stores in the top when the valve is open.
- C. Orient the valve such that the seat is opposite the high-pressure side.

### 3.06 ASSEMBLING JOINTS

- A. Bolt holes of flanged valves shall straddle the horizontal and vertical centerlines of the pipe run to which the valves are attached. 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. Install lug-type valves with separate hex head machine bolts at each bolt hole and each flange (two bolts per valve bolt hole).

### 3.07 VALVE FIELD TESTING

- A. Test valves for leakage at the same time that the connecting pipelines are hydrostatically tested. See Section 400515 for pressure testing requirements. Protect or isolate any parts of valves, actuators, or control and instrumentation systems whose pressure rating is less than the pressure test. Valves shall show zero leakage. Repair or replace any leaking valves and retest.
- B. Operate manual valves through three full cycles of opening and closing. Valves shall operate from full open to full close without sticking or binding. If valves stick or bind, or do not operate from full open to full closed, repair or replace the valve and repeat the tests.

END OF SECTION

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## SECTION 402040 DUCTILE-IRON PIPE AND FITTINGS

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section describes materials, testing, and installation of ductile-iron pipe and fittings 6 inches and smaller.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Painting and Coating: 099000.
- B. Trenching, Backfilling, and Compacting: 312316.
- C. General Piping Requirements: 400500.
- D. Pressure Testing of Piping: 400515.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300
- B. Provide an affidavit of compliance with standards referenced in this specification, e.g., AWWA C151. Submit copy of report of pressure tests for qualifying the designs of all sizes and types of AWWA C153 fittings that are being used in the project. The pressure test shall demonstrate that the minimum safety factor described in AWWA C153, Section 5.5 is met.
- C. Provide the following information:
  - 1. Lining thickness.
  - 2. Wall thickness.
  - 3. Show deflections at mechanical joints.
  - 4. Submit joint and fitting details and manufacturer's data sheets.
- D. Submit drawing or manufacturer's data sheet showing flange facing, including design of facing serrations.

## PART 2- MATERIALS

### 2.01 PIPE

Pipe shall be cast ductile (nodular) iron, conforming to AWWA C151.

### 2.02 PIPE WALL THICKNESS

- A. Minimum wall thickness for pipe having push-on or mechanical joints, restrained joints, plain ends, or cast flange ends shall be Special Class 53, unless otherwise shown in the drawings.

### 2.03 FITTINGS

- A. Fittings 4 inches and smaller shall conform to AWWA C110 with a minimum pressure rating of 250 psi. Material shall be ductile iron. Flanges shall be flat faced.
- B. Restrained mechanical joint fittings conforming to AWWA C153 may be used in lieu of AWWA C110 fittings.

### 2.04 FLANGES

- A. Flanges shall be solid back, Class 125 per AWWA C115. Flanges on pipe shall be either cast or threaded. Material shall be ductile iron.
- B. Flanged pipe and fittings shall be shop fabricated, not field fabricated. Threaded flanges shall comply with AWWA C115. Flanges shall be individually fitted, and machine tightened in the shop, then machined flat and perpendicular to the pipe barrel. Flanges shall be back faced parallel to the face of flange. Prior to assembly of the flange onto the pipe, apply a thread compound to the threads to provide a leak-free connection. There shall be zero leakage through the threads at a hydrostatic test pressure of 250 psi without the use of the gasket.

### 2.05 PIPE LINING

- A. Line pipe and fittings per Section 099000, System No. 6A.
- B. Line blind flanges per Section 099000, System No. 6A.

### 2.06 GASKETS FOR FLANGES

See Section 400500.

### 2.07 GASKETS FOR MECHANICAL, PUSH-ON, AND RESTRAINED JOINTS

Synthetic rubber in accordance with AWWA C111.

## 2.08 BOLTS AND NUTS FOR FLANGES

See Section 400500.

## 2.09 JOINTS

- A. Joints in aboveground or submerged piping or piping located in vaults and structures shall be flanged.
- B. Joints in buried piping shall be of the push-on or mechanical-joint type per AWWA C111 except where flanged joints are required to connect to valves, meters, and other equipment.

## PART 3- EXECUTION

### 3.01 DELIVERY, UNLOADING, AND TEMPORARY STORAGE OF PIPE AT SITE

- A. Use unloading and installation procedures that avoid cracking of the lining. If necessary, use plastic sheet bulkheads to close pipe ends and keep cement-mortar lining moist.
- B. Deliver the pipe alongside the pipelaying access road over which the pipe trailer-tractors can travel under their own power. Place the pipe in the order in which it is to be installed and secure it from rolling.
- C. Do not move pipe by inserting any devices or pieces of equipment into the pipe barrel. Field repair linings damaged by unloading or installation procedures.

### 3.02 SANITATION OF PIPE INTERIOR

- A. During laying operations, do not place tools, clothing, or other materials in the pipe.
- B. When pipelaying is not in progress, close the ends of the installed pipe by a child- and vermin-proof plug.

### 3.03 INSTALLING FLANGED PIPE AND FITTINGS

Install in accordance with Section 400500. Cut the bore of the gaskets such that the gaskets do not protrude into the pipe when the flange bolts are tightened.

### 3.04 INSTALLING BURIED PIPING

- A. Install in accordance with AWWA C600 and Section 312316.

### 3.05 JOINT DEFLECTIONS FOR BURIED PIPE

- A. Do not exceed the following deflection angles for unrestrained buried pipe joints:

Pipe Size (inches)	Maximum Deflection (degrees)	
	Push-On Joint	Mechanical Joint
4	4	6 1/2

- B. For restrained joints, do not exceed 80% of the manufacturer's recommended maximum deflections.
- C. Small angular changes (less than 7 degrees) in horizontal alignment defined in the drawings by a point of inflection (PI) with no accompanying curve data shall be approximated as a curve by deflecting by equal amounts equal length pipe segments to create a curve equally distributed on both sides of the given PI. Accomplish a larger (greater than or equal to 7 degrees) change in horizontal alignment where a curve is not called for in the drawings through the use of an elbow placed at the station of the PI shown in the drawings. Provide thrust restraint as required in the drawings.
- D. Small angular changes (less than 5 degrees) in vertical alignment may be accomplished by the use of pulled joints. For larger vertical deflections, place an elbow at the station and elevation of the vertical PI shown in the drawings. Provide thrust restraint as required in the drawings.
- E. Assemble joints in accordance with AWWA C600 and the manufacturer's recommendations.

3.06 INSTALLING ABOVEGROUND OR EXPOSED PIPING

See Section 400500.

3.07 PAINTING AND COATING

- A. Line all ductile iron piping and fittings per Section 099000, System No. 6A.
- B. Coat ductile iron piping in wet well and between wet well and valve vault per System No. 6A.
- C. Coat pipe located above ground and in vaults per Section 099000, System No. 10. Apply prime coat in the shop before transporting pipe to the jobsite. Apply intermediate and finish coats in the field before installing the pipe, then touch up after installation.
- D. Provide asphaltic coating on buried pipe and fittings. Wrap with polyethylene sheeting per Section 099754.



3.08 FIELD HYDROSTATIC TESTING

Test pressures are shown in Section 400515. Test in accordance with Section 400515.

3.09 BURIED WARNING AND IDENTIFICATION TAPE

Provide non-metallic warning tape per drawings. Warning and identification shall read "CAUTION BURIED FORCE MAIN PIPING BELOW" or similar wording.

END OF SECTION

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## SECTION 402092 PVC DISTRIBUTION PIPE (AWWA C900)

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials, installation, and testing of PVC force main pipe conforming to AWWA C900.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Painting and Coating: 099000.
- B. Polyethylene Sheet Encasement (AWWA C105): 099754.
- C. Trenching, Backfilling, and Compacting: 312316.
- D. General Piping Requirements: 400500.
- E. Pressure Testing of Piping: 400515.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Provide affidavit of compliance with AWWA C900.
- C. Submit fully dimensioned cross-section of the bell and barrel of the pipe. Show the bell maximum outside diameter in the pressurized area and its minimum wall thickness at the same location.
- D. Submit copies of the following manufacturer-required tests conducted on project pipe:
  - 1. Quick-burst strength of pipe and couplings.
  - 2. Flattening resistance of pipe.
  - 3. Record of additional tests after test sample failure.
- E. Submit manufacturer's literature of gray iron and ductile-iron fittings including dimensions, thickness, weight, coating, lining, and a statement of inspection and compliance with the acceptance tests of AWWA C110 or C153. Submit copy of report of pressure tests for qualifying the designs of all sizes and types of AWWA C153 fittings that are being used in the project. The pressure test shall

demonstrate that the minimum safety factor described in AWWA C153, Section 53-15 is met.

- F. Submit outline drawings and materials description of service connection saddles, corporation stops, and pipe plugs.

## PART 2- MATERIALS

### 2.01 PIPE

AWWA C900 rubber-ring gasket bell end or plain end with elastomeric gasket coupling, DR 14, cast iron equivalent outside diameter, material cell classification 12454-B per ASTM D1784.

### 2.02 FITTINGS

- A. Fittings shall conform to AWWA C110 with a minimum pressure rating of 250 psi. Size bells specifically for outside diameter of cast-iron equivalent PVC pipe including rubber-ring retaining groove.
- B. Mechanical joint fittings conforming to AWWA C153 may be used in lieu of AWWA C110 fittings.

### 2.03 LINING AND COATING FOR FITTINGS

- A. Line fittings per Section 099000, System No. 6A.
- B. Coat fittings with standard asphaltic coating.

### 2.04 FLANGES

Flanges on outlets of fittings shall be Class 125 per ASME B16.1.

### 2.05 GASKETS FOR FLANGES

See Section 400500.

### 2.06 BOLTS AND NUTS FOR FLANGES

See Section 400500.

### 2.07 RESTRAINED JOINTS

Provide restrained joints where indicated in the drawings. Restrained joints shall be provided by restraining systems that incorporate a series of machined serrations on the inside diameter of a restraint ring to provide positive restraint. Restraining systems shall meet or exceed the requirements of UNI-B-13-94 and ASTM F1674 and the following:

- A. Restraint devices for bell-and-spigot joints shall consist of a split restraint ring installed on the spigot, connected to a solid backup ring seated behind the bell.
- B. Restraint devices for connection to ductile-iron mechanical joints shall consist of a split restraint ring installed behind the ductile-iron fitting follower gland and gasket and shall retain the full deflection capability of the joint.
- C. The split restraint ring shall be machined to match the outside diameter of the pipe, provide full 360-degree support around the barrel of the pipe, and shall incorporate a series of machined serrations for gripping the outside surface of the pipe. The serrations shall be uniform and extend the full circumference of the clamp. The ring shall also incorporate a positive means of avoiding applying excessive clamping force to the pipe.
- D. Materials used in the restraint device shall be ductile iron conforming to ASTM A536, Grade 60-42-12 or 65-45-12.
- E. T-bolts, studs, and connecting hardware shall be high-strength, low alloy material in accordance with AWWA C111.
- F. Design restraining devices to have a 2:1 safety factor based on the design strength of the pipe.
- G. Restraining devices shall be UNI-Flange Block Buster Series 1300 or 1500, EBAA Iron Series 1600, or equal.

## PART 3- EXECUTION

### 3.01 PRODUCT MARKING

Legibly mark pipe at 5-foot intervals and each coupling to identify the nominal diameter, the outside diameter base, that is, cast-iron or steel pipe (IPS), the material code for pipe and couplings, the dimension ratio number, AWWA C900, and the seal of the testing agency that verified the suitability of the material for potable water service (NSF in the United States).

### 3.02 DELIVERY AND TEMPORARY STORAGE OF PIPE

- A. Ship, store, and place pipe at the installation site, supporting the pipe uniformly. Avoid scratching the pipe surface. Do not stack higher than 4 feet or with weight on bells. Cover to protect from sunlight.
- B. Do not install pipe that is gouged or scratched forming a clear depression.

### 3.03 PIPE LAYOUT FOR CURVED ALIGNMENT

Pipe lengths may be bent for curved alignment but to no smaller radius curve than the following:

<b>Pipe Diameter (inches)</b>	<b>Minimum Curve Radius (feet)</b>
4	400

### 3.04 HANDLING PIPE

Hoist pipe with mechanical equipment using a cloth belt sling or a continuous fiber rope that avoids scratching the pipe. Do not use a chain. Pipes up to 12 inches in diameter may be lowered by rolling on two ropes controlled by snubbing. Pipes up to 6 inches in diameter may be lifted by hand.

### 3.05 INSTALLING BURIED PIPING

- A. Install in accordance with AWWA C605, Section 312316, and as follows.
- B. When installing pipe in trenches, do not deviate more than 1 inch from line or 1/4 inch from grade. Measure for grade at the pipe invert.
- C. Backfill materials in the pipe zone shall be imported sand per Section 312316. Do not add successive layers unless the previous layer is compacted to 90% relative compaction per ASTM D1557.
- D. Compact material placed within 12 inches of the outer surface of the pipe by hand tamping only.
- E. Compact trench backfill to the specified relative compaction. Do not float pipe. Do not use high-impact hammer-type equipment except where the pipe manufacturer warrants in writing that such use will not damage the pipe.

### 3.06 ASSEMBLY OF PIPE JOINT

- A. The spigot and bell or bell coupling shall be dirt free and slide together without displacing the rubber ring. Lay the pipe section with the bell coupling facing the direction of laying.
- B. Insert the rubber ring into the groove in the bell in the trench just before joining the pipes. First clean the groove. Observe the correct direction of the shaped ring. Feel that the ring is completely seated.
- C. Lubricate the spigot over the taper and up to the full insertion mark with the lubricant supplied by the pipe manufacturer. If the lubricated pipe end touches dirt, clean the pipe end and reapply lubricant.

- D. Insert the spigot into the bell and force it slowly into position.
- E. Check that the rubber ring has not left the groove during assembly by passing a feeler gauge around the completed joint.

### 3.07 WRAPPING FITTINGS AND RESTRAINED JOINT DEVICES

Wrap buried cast- and ductile-iron fittings and restrained joint devices with wax tape per Section 099752 and polyethylene per Section 099754.

### 3.08 FIELD HYDROSTATIC TESTING

Test pressures are shown in Section 400515. Test in accordance with Section 400515.

END OF SECTION

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## SECTION 409510 CONTROL PANELS

### PART 1- GENERAL

#### 1.01 DESCRIPTION

This section includes materials and installation of control panels for lift station pumping systems. The lift station controls can be included within the motor control center. Alternatively, a stand-alone control panel can be provided.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Motor Control Centers: 262419.
- B. Submersible Raw Wastewater Pumps: 432140.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit a complete list of equipment, materials, and any details required to demonstrate that the equipment will function properly as a unit. This material shall include:
  - 1. System configuration with single-line diagrams.
  - 2. Detailed descriptions of equipment including weights, dimensions, installation requirements, and heat dissipation.
  - 3. Seismic anchoring calculations with equipment submittals. Calculations shall be performed by a licensed civil or structural engineer employed by the equipment manufacturer and registered in the state of California. Include equipment anchoring methods. Include anchoring locations, anchor types, and minimum anchor embedment depths. Anchors shall have ICC-approved anchorage values.
  - 4. Internal panel layouts indicating spacing and dimensions.
  - 5. Panel front layouts.
  - 6. Nameplates.
- C. Submit control schematic diagrams in a "ladder diagram" format that satisfy the following minimum requirements:

1. Show unique rung numbers on left side of each rung. Provide unique wire numbers for all wires between terminals.
2. Show terminal numbers for all devices, relays, timers, contacts, etc.
3. Where the internal wiring diagrams of subassemblies are furnished on separate sheets, show as a rectangle in the schematic diagram with external points identified and cross-referenced to the separate sheets of the control circuit. Show coils and contacts internal to the subassemblies in the rectangle connected to their terminal points.
4. Use a cross-referencing system in conjunction with each relay coil so that associated contacts may be readily located on the diagram. Where a relay contact appears on a sheet separate from the one on which the coil is shown, describe the purpose of the contact on the same sheet. Show spare contacts.
5. Show symbols of external field devices on the schematic (ladder) diagram with utilities turned off (electric power, air, gas, oil, water, lubrication, etc.) and with the equipment at its normal starting position. If the equipment is shown in a specific position, identify the position.
6. 6. Show contacts of multiple contact devices, e.g., selector switches, on the line of the schematic diagram where they are connected in a circuit. Indicate a mechanical connection between the multiple contacts by a dotted line or arrow. This does not apply to control relays, starters, or contactors. Use additional charts or diagrams to indicate the position of multiple contact devices. Show the purpose or function of switches adjacent to the symbols. Show the purpose or function of controls such as relays, starters, contactors, solenoids, subassemblies, and timers on the diagram on the right side of the respective rung.
7. The control panel manufacturer shall review the control schematic diagrams provided in the drawings, shall identify any adjustments that might be required to achieve the intended control features described in the drawings, and shall implement such changes, prior to shipping the equipment. If further adjustments are required, make such adjustments in the field, with the consent of the Owner's Representative.

## PART 2- MATERIALS

### 2.01 SYSTEM RESPONSIBILITY

The equipment manufacturer shall provide the control panel as part of a complete control system for the sewer lift station. The panel shall include wiring, panel, controls, lights, and receptacles. Panel shall be by Primex, Tesco, ProUsys, or equal.

## 2.02 ELECTRICAL CONTROL PANEL ENCLOSURE

- A. Control Panel shall be included with the motor control center in a combined cabinet. See Section 262419. Alternatively, provide control panel in a separate enclosure. Enclosure shall be NEMA 3R.
- B. Labeling of Controls and Instruments: Clearly label controls and instruments to indicate function.
- C. Fabricate panel and label per the NEC, Article 409. Short-circuit current rating (SCCR) of panel shall be equal to or greater than the relevant value indicated in the electrical drawings.

## 2.03 COMPONENT GENERAL REQUIREMENTS

Components described or listed in the following sections shall comply with Section 260101.

## 2.04 SWITCH CONTROLS

- A. Provide switches to accomplish the following minimum functions:
  - 1. Disconnect the control circuit.
  - 2. Select the mode of operation for each pump.
  - 3. Select the sequence of equipment operation.
  - 4. Operate the control system as described below.
  - 5. Override all controls except motor overload relays.
- B. Connect equipment mode selector switches to permit manual start and manual stop of each pump. Connect each switch to one or more indicators, which shall be illuminated to indicate the selected mode of operation. Manual operation shall not override shutdown systems supplied with the control system.
- C. Sequence selector switch shall permit selection of automatic equipment operation or manual start/stop operation.
- D. Connect override switches to bypass the control system and shut down systems supplied with it to provide manual start of each piece of equipment individually in the event of level control system malfunction.
- E. Provide front panel alarm lights for the following alarm conditions:
  - 1. High level.
  - 2. Pump Overtemp (for each pump)

### 3. Pump Seal Fail (for each pump)

#### 2.05 WIRING

- A. The equipment package as furnished by the manufacturer shall be completely wired, except for the power feeder lines and final connections to remote alarm devices. Wiring, workmanship, and schematic wiring diagrams shall be in compliance with the JIC, NMTBA, and NEC.
- B. Control circuit wiring inside the panel, with the exception of wiring for solid-state electronics circuitry, shall be 14 gauge minimum, Type MTW or THW, 600 volts. Wiring in conduit shall be 12-gauge minimum.
- C. Terminate unshielded wires extending from components mounted on door on a terminal block mounted on the back panel. Do not use splices and solder-type lugs on any wires in the panel enclosure. Wiring outside the panel shall be in conduit.

#### 2.06 CONVENIENCE RECEPTACLE

- A. Provide ground fault circuit interrupter (GFCI): GFCI receptacles shall be duplex, three-wire, NEMA 5-15 R or 5-20 R, 125-volt, weather-resistant, parallel slot, polarized where indicated, in ivory color. GFCI receptacles shall be 20A feed-through type, capable of protecting connected downstream receptacles on single circuit, grounding type UL-rated Class A, 60 Hz, with solid state ground fault sensing and signaling, with 4-6 milliamperes ground fault trip level, and UL listed. Devices shall be Hubbell GFR5262SGI or Cooper TWRSGF15I for 15 ampere, or equal. It shall be protected by a separate 15 ampere trip rated circuit breaker accessible from the operator's door.
- B. ces shall be Hubbell GFR5262SGI or Cooper TWRSGF15I for 15 ampere, or equal. It shall be protected by a separate 15 ampere trip rated circuit breaker accessible from the operator's door.
- C. R5262SGI or Cooper TWRSGF15I for 15 ampere, or equal. It shall be protected by a separate 15 ampere trip rated circuit breaker accessible from the operator's door.

#### 2.07 LOCAL ALARM SYSTEM

- A. A top mounted weatherproof, strobe alarm indication light assembly with shatter resistant polycarbonate red lens mounted on a polycarbonate/ABS blend case shall be provided. The alarm light shall be NEMA 4X rated, suitable for indoor or outdoor mounting and operate on 120 VAC and be PLC rated. The strobe tube shall provide a minimum of 300,000 peak candela output and shall be rated for 3,000 hour life.
- B. The alarm light shall flash upon occurrence of an alarm condition.

- C. A left side mounted weatherproof, audible alarm horn assembly with silence push-button, shall be provided. The alarm horn suitable for indoor or outdoor mounting and operate on 120 VAC. The horn shall provide a minimum of 78dB output and shall be rated for at least 400 hour life @ 50% duty cycle. The push-button shall be 30.5mm, NEMA 4X rated. All pilot devices specified herein are to be Square D Class 9001 Type SK Line.

## 2.08 SUBMERSIBLE LEVEL TRANSMITTER

- A. The submersible all-titanium pressure transmitter shall provide an electrical 2-wire d-c current signal proportional to the pressure applied to the unit's diaphragm-sensing element. Provide the pressure transmitter with the following features:
  - 1. Conduit adapter.
  - 2. Cable strain relief.
- B. Accuracy of the pressure transmitter shall be  $\pm 0.25\%$  of calibrated span.
- C. The pressure transmitter shall be that manufactured by MPE Inc., Wika, or equal.
- D. Provide stainless steel levelguard anti-clog attachment, termination enclosure, desiccant, cable clamp, and vent tube filter. Provide factory installed cable with sufficient length so that it is continuous from transmitter to control panel Install per manufacturer's recommendations.

## 2.09 FLOAT SWITCHES

- A. The contractor shall furnish, install, and wire the float switches for control as shown on the drawings.
- B. Each float switch shall contain a mercury-free switch, which shall actuate when the longitudinal axis of the float is horizontal and de-actuate when the liquid level falls 1 inch below the actuation elevation. Float construction shall consist of a polypropylene housing with a firmly bonded electrical cable protruding. One end of the cable shall be permanently connected to the enclosed mercury switch, and the entire assembly shall be encapsulated to form a completely watertight and impact-resistant unit.
- C. Switch rating shall be 10 amperes at 120 volts, 60 hertz, noninductive. Switch contacts shall be normally open as detailed in the schematic drawings. Float cable shall be PVC Type STO, No. 18 conductors (41 strand) rated 600 volts. Provide cable length as required for each site.
- D. Suspended-type floats shall include an internal stabilizing weight so that the float may be suspended from above.

- E. The float switches shall be Eco-Float Model GSI-NO by Anchor Scientific, or equal.

## 2.10 OVER-TEMPERATURE / SEAL FAILURE PUMP PROTECTION ALARM

- A. Over-temperature / Seal failure protection shall be provided in the control panel to operate in conjunction with the over-temperature switch and sensors in each pump motor. The control shall provide pump operation lockout upon the occurrence of high temperature, or seal failure. Protection device shall be provided by the pump manufacturer.
- B. The circuitry shall include NEMA Type 4X, red “pump overtemp” shutdown and ‘seal leak’ alarm indicating lights (with front replaceable LED bulbs) and a manual reset push-button on the operator’s door for each pump motor.

## 2.11 FUNCTIONAL CONTROL SYSTEM DESCRIPTION

- A. The controller shall be comprised of the following:
  - 1. Color touch screen
  - 2. LED backlight - Sunlight readable
  - 3. Modbus communications
  - 4. Optional Ethernet communication card
  - 5. Motor Amps monitoring
  - 6. Pump control modes built in: level transmitter with two backup float switches
  - 7. Level indication
  - 8. Flow monitoring when using level transmitter (Volumetric flow calculation)
  - 9. Alarm log with time and date stamp
  - 10. Data logging (pump run time, Starts, volume pumped, GPM)
  - 11. Password capable
- B. The operation of the system shall be as follows:
  - 1. When the HAND-OFF-AUTO switch is in the HAND position, the corresponding pump will run, bypassing the automatic control until the operator turns the switch to the OFF position. If the motor heat sensor is faulted or an overload is present, the motor will not be permitted to run.

2. When the HAND-OFF-AUTO switch is in the OFF position, the corresponding pump will be off and not permitted to run.
  3. When both HAND-OFF-AUTO switches are in "Auto" position, the pumps shall be controlled via the controllers.
  4. When the water level rises to user adjustable "Lead Pump On" set point, the lead pump shall be called and shall run until the water level goes below the "Pump Off" user adjustable set point. When the lead pump shuts down, the alternation logic shall index to the next pump for the next pumping cycle. If the water level continues to rise to the "High Level Alarm & Lag Pump On" set point, the lag pump will be called, after a time delay, to run along with the lead pump. Both pumps will run until the water level reaches the "Pump Off" set point. The "Lag Pump On" set point shall override the "Lead Pump On" set point in case of a lead pump failure.
  5. It will be called, after a time delay, to run along with the lead pump. Both pumps will run until the water level reaches the "Pump Off" set point. The "Lag Pump On" set point shall override the "Lead Pump On" set point in case of a lead pump failure.
  6. It reaches the "Pump Off" set point. The "Lag Pump On" set point shall override the "Lead Pump On" set point in case of a lead pump failure.
  7. If the pump motor heat sensor fault and/or an overload is present, the corresponding motor will not be permitted to run. The next pump shall be called to run and an alarm shall be activated.
  8. If the water level rises to the "High Level Alarm & Lag Pump On" set point, a flashing alarm beacon and audible alarm shall be activated. The beacon and audible alarm shall be active until the water level goes below the "High Level Alarm & Lag Pump On" set point.
  9. If the level continues to rise above the "High Level Alarm & Lag Pump On" set point, an available pump will be called, and the horn and beacon be ON. The pump shall remain ON until the level drops below the "Pump Off" set point or times out if an off delay timer is used.
  10. Should the level drop below the "Pump Off" set point at any time during normal transmitter operation, the pumps will stop. The pumps will reset and be capable of starting again as the level rises above the "Lead Pump On" set point or above the "Low Level Backup" set point.
- C. There shall be an external "Silence/Test" pushbutton that will; when pressed when in normal condition will test the audible and alarm light, and when in a high level condition will silence the audible alarm.

### PART 3 - EXECUTION

### 3.01 FIELD TESTS

- A. Provide manufacturer's time in field to check calibration, adjust, test, and place system into service.
- B. Test the operation of each interlock to verify that the interlock performs its function.
- C. Test system for correct execution of control logic. Adjust wiring connections in panel to correct errors.

END OF SECTION



## SECTION 432140 SUBMERSIBLE RAW WASTEWATER PUMPS

### PART 1 - GENERAL

#### 1.01 DESCRIPTION

This section includes materials, installation, and testing of submersible raw wastewater pumps designed to operate in a wet well under submerged conditions.

#### 1.02 RELATED WORK SPECIFIED ELSEWHERE

- A. Painting and Coating: 099000.

#### 1.03 SUBMITTALS

- A. Submit shop drawings in accordance with the Special Provisions and Section 013300.
- B. Submit dimensional drawings.
- C. Submit manufacturer's catalog data and detail drawings showing all pump parts and describe by material of construction, specification (such as AISI, ASTM, SAE, or CDA), and grade or type. Show linings and coatings. Show outline dimensions and weights of pumps, bases, and motors.
- D. Submit pump curves from manufacturer's catalog data on which the specified operating points are marked. Show efficiency, brake horsepower, and NPSH required for the selected pump curve for each specified operating point. Show maximum operating speed.
- E. Show impeller diameter, eye area, sphere size, and number of vanes.
- F. Submit setting drawings. Show anchor bolt layout and anchor bolt dimensions.
- G. Submit manufacturer's reports on hydrostatic tests and performance tests.
- H. Submit manufacturer's sample form for reporting the performance test results. Submit at least two weeks before the tests. The test form shall contain the data presented in the sample form in Section 6 of ASME PTC 8.2 or ANSI/HI 14.6.
- I. Submit manufacturer's certified performance curves for review at least two weeks prior to shipping the units from the factory.

#### 1.04 DEFINITIONS

Terms shall be as defined in ANSI/HI 11.6, ANSI/HI 14.6, and ASME PTC 8.2. If there is a discrepancy in definitions between the two publications, the definitions given in ANSI/HI 14.6 shall govern.

#### 1.05 MANUFACTURER'S SERVICES

Provide equipment manufacturer's services at the jobsite for the minimum labor days listed below, travel time excluded:

- A. One labor day for each service listed in the subsection on "Service Conditions" to check the installation and advise during start-up, testing, and adjustment of the pumps.
- B. One labor day to instruct the Owner's personnel in the operation and maintenance of the pumps.

### PART 2- MATERIALS

#### 2.01 PUMP DESIGN

- A. The Contractor shall assign unit responsibility to the pump supplier for the complete pump system, including motors and cooling system control assembly.
- B. Each pump shall be of the vertical, non-clog, single-suction, centrifugal type and shall be suitable for pumping unscreened raw sewage.
- C. The pump, with its appurtenances and electric cable, shall be capable of continuous submergence under water without loss of watertight integrity to a minimum depth of 65 feet.
- D. Design the casing to withstand a hydrostatic test of at least 150% of the pump discharge pressure (suction pressure plus pump differential pressure) at shutoff.
- E. Each pump shall be capable of at least a 5% head increase at normal operating conditions by installing a larger impeller or an impeller of different hydraulic design.
- F. Pump curve shall be continuously rising and shall be free of dips and valleys from the design point to the shutoff head. The shutoff head shall be at least 110% of the head that occurs at the design point.
- G. The NPSH required shall be at least 5 feet less than the minimum NPSH available at all points on the pump curve up to 120% of the flow at the BEP.
- H. Design the pump and its components to operate continuously over a flow range of 70% to 120% of the flow at the BEP.

## 2.02 DISCHARGE CONNECTIONS

- A. The pump shall be automatically connected to the discharge connection elbow when lowered into place and shall be easily removed for inspection or service. Sealing of the pumping unit to the discharge elbow shall be accomplished by a simple linear downward motion of the pump. A sliding guide bracket shall be an integral part of the pump unit. The entire weight of the pump unit shall be guided by no less than two stainless steel guide bars or stainless steel guide wire pressed tightly against the discharge connection elbow. No portion of pump shall bear directly on the floor of the sump.

## 2.03 POWER SUPPLY

Power supply will be 240 volts, 60 hertz, 3 phase.

## 2.04 VIBRATION AND RESIDUAL UNBALANCE

- A. The maximum vibration level shall not exceed ANSI/HI 9.6.4 Section 9.6.4.4.
- B. Maximum residual unbalance in impellers shall not exceed ANSI/HI 9.6.4 Section 9.6.4.5.1.

## 2.05 VOLUTE CASING

Volute casing shall be of a single piece, nonconcentric design with smooth fluid passages at all points large enough to accommodate a replacement for a future impeller 115% of the diameter of the present impeller and to pass any size solids which can pass through the impeller. Casing shall be accurately machined to fit the mechanical seal and suction cover assemblies. Fit the bottom of the volute with an adjustable grey cast iron wear ring. Provide a 3/4-inch drain with plug in the volute.

## 2.06 IMPELLER

- A. Impeller shall be semi-open type with one vane. The impeller shall be cast in one piece and shall be statically and dynamically balanced, double-shrouded throulet with smooth water passage to prevent clogging by stringy or fibrous materials and other matter found in normal raw wastewater applications.
- B. Each impeller shall be keyed to the shaft, and the fastening of the impeller to the shaft shall be made by a locking device. The locking device shall be sealed from the liquid by means of an O-ring and covered and secured to the end face of the shaft by a single bolt.
- C. Fit each impeller with a replaceable wear ring for pumps 5 horsepower and larger to provide sealing between the volute and impeller.

## 2.07 SHAFTS

- A. Pump shaft diameter shall be such that it will not deflect more than 0.002-inch at the mechanical seal face with the largest impeller installed while operating at the maximum pump speed. Tolerance on the shaft diameter shall not exceed 0.002 inch. Dynamic shaft deflection at the stuffing box face shall not exceed 0.002 inch.
- B. The first lateral critical speed of the rotating assembly shall be at least 120% of the maximum pump operating speed.
- C. Surface finish of the shafts or sleeves through the mechanical seal and at the rubbing contact-bearing housing seals shall not exceed a roughness of 32 microinches.
- D. If a carbon steel shaft is used, provide Type 420 stainless steel shaft sleeves having a minimum hardness of 450 Brinell.

## 2.08 PUMP SEAL

- A. Provide each pump with a tandem mechanical shaft seal system. The upper of the tandem set of seals shall operate in an oil chamber located just below the stator housing. This set shall contain one stationary tungsten carbide or cast chromium ring and one positively driven rotating carbon ring functioning as an independent secondary barrier between the pumped liquid and the stator housing. The lower of the tandem set of seals shall function as the primary barrier between the pumped liquid and the stator housing. This set shall consist of a stationary ring and a positively driven rotating ring, both of which shall be tungsten carbide.
- B. Each interface shall be held in contact by its own spring system supplemented by external liquid pressures. The seals shall require neither maintenance nor adjustment but shall be easily inspected and replaceable.
- C. Shaft seals without positively driven rotating members or conventional double mechanical seals with a common single or double spring acting between the upper and lower units requiring a substantial pressure differential to offset external pressure and effect sealing shall not be considered acceptable or equal to the dual independent seal system specified.
- D. The shaft sealing system shall be capable of operating submerged to depths of or pressures equivalent to a minimum of 65 feet. No seal damage shall result from operating the pumping unit out of its liquid environment. The seal system shall not rely upon the pumped media for lubrication.

## 2.09 BEARINGS

- A. Each pump shaft shall rotate on two permanently lubricated bearings. The upper bearing, providing for radial thrust, shall be a single row, roller bearing. The lower bearing shall consist of one double row or two single row angular contact bearing(s) for combined axial and radial loads.
- B. Pump bearings shall be of the antifriction type designed to give 40,000 hours minimum life by L-10 calculations at maximum speed and operating load in continuous operation.

## 2.10 CABLE ENTRY

Each cable entry shall be comprised of a single cylindrical elastomer grommet, flanked by stainless steel washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the entry body containing a strain relief function, separate from the function of sealing the cable. The assembly shall bear against a shoulder in the pump top. The cable entry system shall utilize one of the two designs specified below.

- A. The cable entry junction chamber and motor shall be separated by two terminal boards, which shall isolate the motor interior from foreign material gaining access through the pump top. Both the terminal boards shall be bolted to the interior of the motor housing and sealed by O-rings.
- B. Provide cast-iron, pressure-tight cable entry gland, which shall be sealed by a nitrile rubber ring and compression gland. Design the compression gland to conform to the allowable bending radius of the power cable. In addition, cast each individual conductor wire in resin in such a manner to avoid any water leakage into the motor through capillary action, because of external cable damage or other causes.

## 2.11 MATING SURFACES

- A. Machine and fit mating surfaces of major parts with nitrile O-rings where watertight sealing is required. Machining and fitting shall be such that sealing is accomplished by automatic compression in two planes and O-ring contact made on four surfaces, without the requirement of a specific torque limit. Rectangular cross-sectioned gaskets requiring specific torque limits to achieve compression shall not be considered adequate or equal.
- B. Tolerances of parts shall be such that they allow replacement of any part without additional machining required to ensure sealing as described above. No secondary sealing compounds, greases, or other devices shall be used.

## 2.12 COOLING SYSTEM

- A. The motor cooling system shall consist of ambient cooling by radiation and convection to the surrounding space and conduction through the pump volute to the pumped fluid.
- B. Pumps equipped with water-cooling system consisting of a water jacket are also acceptable. The water-cooling jacket system shall encircle the stator housing. Provide the water jacket with a separate circulation of the pumped liquid. Cooling water shall enter the cooling jacket by way of the pumping vanes, integral with the impeller design, and exit with the pumping media. Cooling media channels and ports shall be non-clogging by virtue of their dimensions. Provide a separate, clear, external water source for motor cooling as well as lower seal flushing. Alternatively, ambient cooling of the motor may be utilized.
- C. Pumps equipped with integral cooling consisting of a pumped ethylene-glycol coolant circulated by means of an impeller on the pump shaft are also acceptable. Provide a cooling jacket and internal pump impeller to circulate the coolant to cool the pump by conduction through the pump volute to the pumped fluid and by radiation and convection to the surrounding space. Alternatively, ambient cooling of the motor may be used when the pump size and duty permits.

## 2.13 ELECTRIC MOTORS

- A. Each pump shall be driven by a vertical, submersible squirrel cage induction motor, shell type design, housed in an air-filled, watertight chamber. The stator winding and stator leads shall be insulated with moisture-resistant Class F insulation which will resist a temperature of 155°C, 40°C ambient plus 115°C rise, and designed for continuous duty, capable of sustaining a minimum of 10 starts per hour.
- B. Motor shall have an explosion proof rating of NEC 500 Class 1, Division 1, Group C & D, Class T3C max surface temp.
- C. The stator shall be dipped and baked three times in Class F varnish and shall be shrink-fitted into the stator housing. The use of bolts, pins, or other fastening devices requiring penetration of the stator housing shall be rejected.
- D. The motor shall be sized to be non-overloading when the pump is operated at any point on the pump performance characteristic curve drawn through the design point and shall have a minimum service factor of 1.10. Motor service factor shall not be used in satisfying pumping requirement.
- E. Equip the stator with three sensors or thermistors embedded in the end coils of the stator winding to monitor stator temperature. Provide one sensor or thermistor in each stator phase, to switch off the unit if a winding temperature of 285°F is exceeded.

- F. If the pump manufacturer uses thermistors in the motor windings, the pump manufacturer shall provide the motor winding thermistor relay and any motor bearing thermistor relays and shall arrange for their installation in the pump motor starter. Both relays shall operate in a 120-volt control circuit and have contacts as shown in the electrical drawings. Adjust and arrange relays to properly respond to the thermistors mounted within the pump-motor housing.
- G. Each pump motor shall have a sensor system to monitor moisture in the stator cavity and temperature sensors within the motor stator windings. Provide a supervision relay for installation in the pump motor starter to trip an alarm if moisture content indicates a failure of the outer mechanical seal or if high temperature is detected in the stator..
- H. Connect sensors and thermistor relays to the pump motor starter in such a manner that their signal can actuate an alarm or provide for immediate shutdown or both.

2.14 MOTOR CABLES

Pump motor power cables installed shall be made of a Hypalon or Protolon synthetic rubber-jacketed, Type SPC multiconductor cable, suitable for submersible pump applications and heavy mechanical stresses. The power cable shall also be sized according to NEC and ICEA standards and also meet with P-MSHA approval or equivalent. Use a separate Hypalon or Protolon synthetic rubber-jacketed, Type SPC cable for temperature and moisture pilot protection signals. The total length of each cable shall be a minimum of 40 feet.

2.15 MATERIALS OF CONSTRUCTION

- A. Materials of construction shall be as listed below:

<b>Component</b>	<b>Material</b>	<b>Specification</b>
Casing, volute, suction and discharge elbows	Cast iron	ASTM A48, Class 35B
Impeller	Cast Iron	ASTM A48, Class 35B
Shaft	Stainless steel	AISI 420
Impeller wear ring	Cast Iron	ASTM A48, Class 35B
Drain and vent plugs	Malleable iron	ASTM A197
Cap screws, bolts, and nuts	Stainless steel	AISI Type 316

2.16 ANCHOR BOLTS, NUTS, AND WASHERS

- A. Anchor bolts, nuts, and washers for pumps installed in wet wells shall be stainless steel .

2.17 SPARE PARTS

A. Provide the following spare parts for each model or size of pump:

Quantity	Description
1	Set of wear rings for impeller and volute
1	Complete set of seals, primary and secondary
2	Sets of radial bearings
2	Sets of thrust bearings
1	Complete set of O-rings or gaskets, whichever applies to the supplied pump unit

B. Pack spare parts in a wooden box; label with the manufacturer’s name and local representative’s name, address, and telephone number; and attach list of materials contained within.

PART 3- EXECUTION

3.01 SERVICE CONDITIONS

A. Pump hydraulic performance conditions and design data shall be as shown below.

Location	Pioneer Lift Station
Liquid pumped	Raw Sewage
Service	Raw Sewage Wet Well
Altitude	60 feet above mean sea level

Pump Data

Capacity (gpm)	Pump Total Head (feet)	Minimum Pump Efficiency (%)
80	33	40
150*	25	49
180	19	47
*Design point.		

Maximum pump speed	1800 rpm
Minimum NPSH available	5 feet



Motor horsepower (minimum)	2.7
Discharge nozzle size	3 inches
Manufacturers and models	Ebara Model 80DLFU61.5 or ABS Model XFP 080C-CB1 or equal

- B. The specified impeller shall be capable of passing a 3-inch sphere.

### 3.02 FACTORY PERFORMANCE TESTING

- A. Each pumping unit shall be subjected to a non-witnessed laboratory performance test. Conduct tests in accordance with the ASME PTC 8.2 or ANSI/HI 14.6, using the actual job driver. The performance test shall be equivalent to Grade 1U per ANSI/HI 14.6, Table 14.6.3.4.
- B. No motor overload above nameplate rating will be allowed at any flow up to 120% of the flow at the BEP.
- C. Deviations and fluctuations of test readings shall conform to ASME PTC 8.2, 1.11 (Type A), or ANSI/HI 14.6, Table 14.6.3.3.3.
- D. Measure flow in accordance with ANSI/HI 14.6, Appendix A.
- E. Perform tests and record data, including head, flow rate, speed, and power, at a minimum of seven points. These points shall include shutoff, minimum flow, midway between minimum flow and design flow, design flow, 120% of design flow, and maximum flow.
- F. Perform a hydrostatic test on pump pressure-containing components per ANSI/HI 14.6, Appendix B.

### 3.03 PAINTING AND COATING

- A. Coat submerged or immersed pumps and motors per Section 099000, System No. 1. Apply the specified coatings at the place of manufacture.

### 3.04 SHIPMENT AND STORAGE

- A. Prepare equipment for shipment including blocking of the rotor when necessary. Identify blocked rotors by means of corrosion-resistant tags attached with stainless steel wire. The preparation shall make the equipment suitable for six months of outdoor storage from the time of shipment, with no disassembly required before operation, except for inspection of bearings and seals.
- B. Identify the equipment with item and serial numbers. Material shipped separately shall be identified with securely affixed, corrosion-resistant metal tags indicating

the item and serial number of 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.

- C. 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.
- D. Store and protect pumps per API 686 (first edition), Chapter 3, paragraphs 1.4 through 1.9, 1.15, 1.16, 1.20, and 1.21 and as described below.
- E. Coat exterior machined surfaces with a rust preventative.
- F. The interior of the equipment shall be clean and free from scale, welding spatter, and foreign objects.
- G. 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 studded openings, use all the nuts needed for the intended service to secure closures.
- H. 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.
- I. Clearly identify lifting points and lifting lugs on the equipment or equipment package. Identify the recommended lifting arrangement on boxed equipment.
- J. Wrap exposed shafts and shaft couplings with waterproof, moldable waxed cloth or volatile-corrosion-inhibitor paper. Seal the seams with oil-proof adhesive tape.
- K. If electric motors are stored or installed outside or are exposed to the weather prior to permanent installation, provide the manufacturer's recommended procedures for extended storage. Provide temporary covers over the motor electrical components. Provide temporary conduits, wiring, and electrical supply to space heaters. Inspect electrical contacts before start-up.

### 3.05 INSTALLING TENSIONING SYSTEM

- A. Attach cable bracket to the lip of the equipment opening. Use cast-in stainless steel bolts.
- B. Attach the flange discharge elbow to the floor of the wet well using cast-in stainless steel anchor bolts.
- C. Install the guide cable/rail per manufacturer's recommendations.

- D. Provide and attach the stainless steel lift chain or cable.

### 3.06 FIELD TESTING

- A. Bump motor to ensure that motor has been connected for proper rotation.
- B. Perform field tests for 24 consecutive hours on each pump. Measure flows at the following head points:
  - 1. Tag Numbers:
  - 2. Location:
  - 3. Service:
  - 4. Maximum rpm:
  - 5. Test Points (Feet):
- C. If the measured flows at the above-tabulated pump heads are more than 5% below the flows obtained on the laboratory or factory test, adjust the impellers or provide new impellers or otherwise repair or replace the pumps or calibrate meters or pressure gauges.
- D. Demonstrate that the pumping units, motors, and control system meet the following requirements:
  - 1. The pumping units operate as specified without excessive noise, cavitation, vibration, and without overheating of the bearings.
  - 2. Automatic and manual controls function in accordance with the specified requirements.
  - 3. Drive equipment operates without being overloaded.

END OF SECTION

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APPENDIX A

CALTRANS ENCROACHMENT PERMIT

**ENCROACHMENT PERMIT**

DOT TR-0120 (REV 05/2023)

Permit No.  
05-23-N-UT-0121In compliance with your application of July 12, 2023Dist/Co/Rte/PM  
05/SB/1/PM 49.95

## Reference Documents:

- Utility Notice No. \_\_\_\_\_ of \_\_\_\_\_
- Agreement No. \_\_\_\_\_ of \_\_\_\_\_
- R/W Contract No. \_\_\_\_\_ of \_\_\_\_\_
- Project code (ID): \_\_\_\_\_ CFC #: \_\_\_\_\_
- Applicant's Reference/ Utility Work Order No. \_\_\_\_\_

Permit Approval Date  
July 03, 2024

Performance Bond Amount (1)	Payment Bond Amount (2)
\$0	\$0

Bond Company  
\$ N/A

Bond Number (1)	Bond Number (2)
\$ N/A	\$ N/A

TO: CITY OF GUADALUPE  
918 Obispo Street  
Guadalupe, CA 93434

\_\_\_\_\_, **PERMITEE**

and subject to the following, PERMISSION IS HEREBY GRANTED to:

The existing facility is a confined space safety hazard. The pumps are oversized for existing flows. The force main is not located within the City easement. The lift station replacement project includes above grade or submersible pump installation to remove the confined space hazard. The pumps will be replaced with appropriately sized pumps. The force main will be rerouted to City right-of-way. The work in the Caltrans right-of-way includes the installation of approximately 130 feet of 4-inch force main. The force main will convey sewage.

**THIS PERMIT IS NOT A PROPERTY RIGHT AND DOES NOT TRANSFER WITH THE PROPERTY TO A NEW OWNER.**

The following attachments are also included as part of this permit (check applicable):

- YES  NO General Provisions
- YES  NO Utility Maintenance Provisions
- YES  NO Storm Water Special Provisions
- YES  NO Special Provisions
- YES  NO A Cal-OSHA Permit, if required: Permit No. \_\_\_\_\_
- YES  NO As-Built Plans Submittal Route Slip for Locally Advertised Projects
- YES  NO Storm Water Pollution Protection Plan

In addition to fee, the permittee will be billed actual costs for:

- YES  NO Review
- YES  NO Inspection
- YES Field Work  
(if any Caltrans effort expended)

**As-built Plans are Required**

- YES  NO

- YES  NO The information in the environmental documentation has been reviewed and considered prior to approval of this permit.

This permit is void unless the work is completed before July 31, 2025

This permit is to be strictly construed and no other work other than specifically mentioned is hereby authorized.

No project work shall be commenced until all other necessary permits and environmental clearances have been obtained.

CC:  
#1: Payman Hamed  
#2: JOSHUA J MILTON  
#3:  
#4:

APPROVED:

Scott Eades, District Director

BY

Valerie Beard  
Valerie Beard (Jul 3, 2024 14:07 PDT)

VALERIE BEARD, District Permit Engineer

**ADA Notice**

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## California Department of Transportation

50 HIGUERA STREET | SAN LUIS OBISPO, CA 93401-5415  
(805) 549-3111 | TTY 711  
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7/1/2024

05-SB-1-49.95  
05-23-N-UT-0121

City of Guadalupe  
Attn: Jeff van den Eikhof  
918 Obispo St, Guadalupe, CA 93434

Dear Jeff:

Attached is your approved encroachment permit. **DO NOT BEGIN WORK UNTIL YOU HAVE FIRST READ THE ENTIRE PERMIT CAREFULLY AND COMPLETELY AND CONTACTED THE STATE INSPECTOR LISTED ON YOUR PERMIT.**

**This permit is a legal and binding contract once work on it has begun.** You are subject to the provisions contained in the permit and in the attached Encroachment Permit General Provisions. If there is any question regarding interpretation of any detail in the permit or the General Provisions, you may contact the inspector listed on your permit or our office at (805) 549-3152. Thank you in advance for your cooperation.

Pursuant to the Executive Department, State of California, Proclamation of a State of Emergency, signed on October 27, 2019, and under the direction of the Office of Emergency Services and the State Emergency Plan, work authorized by this permit will be suspended when a planned Public Safety Power Shutoff (PSPS) notification is in effect. Unless Permittee has obtained special approval from the Director of Caltrans or his assigns to work during a PSPS event, Permittee must stop work and make all traveled ways and roadsides safe for public travel and emergency services if notified by the Director of Caltrans or his assigns.

Sincerely,

*Marshall Erata*

for  
VALERIE BEARD, PE  
District Permit Engineer

**Work authorized under this permit:**

Installation of approximately 130 feet of 4-inch force main as shown on the attached plans and as directed by the permit provisions in US Highway 1 right of way at postmile 49.95 in the County of Santa Barbara.

**Permit Distribution List:**

Permit File  
Payman Hamed - Inspector  
Joshua Milton - D.O.

**STATE PERMIT INSPECTOR**

Unless approved otherwise by the State Permit Inspector, **Permittee must contact the State Permit Inspector listed below, at the following times, before starting work in the State right of way:**

- **A minimum of two weeks** prior to commencing work for a pre-job meeting to discuss permit provisions, notification requirements, and scheduling.
- **A minimum of two working days** prior to commencing work.

<b>State Permit Inspector:</b> Payman Hamed	<b>Phone:</b> (805) 276-1570
<b>Email:</b> payman.hamed@dot.ca.gov	<b>Fax:</b>

**Notification requirements that will impact your work schedule:**

1. **Changes to horizontal or vertical clearances;** minimum of 25-day advance notification.
2. **Lane closures:** completed "Weekly Traffic Update" form must be submitted by noon the Monday prior to date of proposed lane closure.
3. **Public Affairs:** completed "Public Affairs – Permitted Activity Notification" form must be submitted as early as possible (One Week Ahead is Best) prior to beginning of permitted activity.
4. When work has been interrupted for more than five working days, the Permittee must notify the Caltrans Permit Inspector a minimum of two working days prior to **restarting work**.

This issued encroachment permit is void unless the permitted activity or construction



is completed by the void date shown on page 1 of the encroachment permit form DOT TR-0120. The Permittee is solely responsible to keep track of the permit void date. All requests to extend this void date must be received by the District 5 Encroachment Permits Office while the encroachment permit is valid. Request for an extension received after the permit void date cannot be processed.

Pursuant to the Executive Department, State of California, Proclamation of a State of Emergency, signed on October 27, 2019, and under the direction of the Office of Emergency Services and the State Emergency Plan, work authorized by this permit will be suspended when a planned Public Safety Power Shutoff (PSPS) notification is in effect. Unless Permittee has obtained special approval from the Director of Caltrans or his assigns to work during a PSPS event, Permittee must stop work and make all traveled ways and roadsides safe for public travel and emergency services if notified by the Director of Caltrans or his assigns.

### **ADDITIONAL PERMIT ATTACHMENTS**

- PUBLIC AFFAIRS PROJECT NOTIFICATION
- WEEKLY TRAFFIC UPDATE
- HOLIDAY AND SPECIAL DAY LANE CLOSURE RESTRICTION CALENDAR
- DISTRICT 5 NON-STANDARD SPECIAL PROVISION 12-4.02C(3)(f)
- CALTRANS STANDARD PLANS T9-T14, T30-T34
- FORM CEM-3101
- HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT
- SIDEWALKS (CS)
- STEEL PLATE BRIDGING UTILITY
- SURVEYS (SV)
- TRAFFIC STRIPING, MARKERS, AND SIGNS
- UTILITY UNDERGROUND PROVISIONS (UG)
- Other:
  - Encroachment Permit Trench Detail (TR-0153)
  - Limits of Grind and Overlay for Pavement Replacement
  - Typical Temporary Sign Support Details
  - Typical Portable Changeable Message Sign Placement
  - Encroachment Permit Survey Grid (TR-0151)
  - Encroachment Permit Applicant: Contractor(s) Authorization Form (DOT TR-0429)
  - Notice of Completion TR-0128
  - Completed Standard Encroachment Permit Application (DOT TR-0100)
  - Approved Plans

### **PLANS AND SPECIFICATIONS**

If conflicts arise between Special Provisions, Plans, Caltrans Standard Plans, Standard Specifications, or other Caltrans standards, the Caltrans Inspector shall make the final determination regarding selection or interpretation of standards and/or specifications. State Standards and Specifications must apply to all work within the State right of way unless directed otherwise by the State Inspector. Reference to the Engineer in the State Standard Specifications must include the State

Representative (Caltrans Permit Inspector or District 05 Permit Engineer).

Attention is directed to Section 5 of the current State Standard Specifications and the Encroachment Permit General Provisions (TR-0045) regarding control of work and permit work plan revisions. Additionally, the State Permit Inspector may require reasonable additions, modifications, or revisions to the scope of work at no cost to the State if the change is in the best interest of the State facility where the encroachment permit is being granted and Caltrans policy, Standard Specifications, or Permit Provisions are unclear.

### **WORK HOURS**

Work authorized by this permit that does not restrict or close any traffic lane or shoulder may be performed on weekdays between the hours of 9:00 AM and 3:00 PM.

Traffic lane and shoulder restrictions or closures:

**Hours to be determined by the Caltrans Permit Inspector based on location of work.**

**Work and lane closure restrictions will apply prior to and after a holiday or holiday weekend:**

- 1. As shown on the attached Holiday and Special Day Lane Closure Restrictions calendar.**
- 2. Work schedules beyond the calendar dates shall comply with the attached District 5 Non-Standard Special Provision 12-4.02C(3)(f).**
3. When a designated legal holiday falls on a Sunday, the following Monday shall be a designated legal holiday.
4. When November 11th falls on a Saturday, Friday November 10th shall be a designated legal holiday.

The State Inspector must approve deviations from these hours in advance.

**All work that will impact the normal operations of Caltrans traffic signal facilities must be performed under traffic control and during the hours approved by the Caltrans Inspector and Caltrans District 5 Traffic Management Center.**

## **Caltrans Lane Closure System (LCS) Compliance Contacts**

Work authorized by this permit will require compliance and proper notification in LCS.

If not identified elsewhere in this permit, Permittee or Permittee's contractor must provide the contact information for two personnel, who will be ensuring LCS compliance during the pre-job meeting with the Caltrans Permit Inspector. Contact information shall include personnel's full names, phone numbers and email addresses.

### **CONDITIONS OF APPROVAL**

1. Applicant's contractor shall submit shoring plans that must be approved prior to beginning construction.
2. Work authorized by this permit requires electronic Adobe file format (.pdf) "As-Built" plans. As-built files should be received within 30-days of the completion of the permitted work unless otherwise arranged with the Caltrans Permit Inspector. Failure to provide as-built files may result in the suspension of Permittee's encroachment permit activities within Caltrans District 5.
3. Failure to meet with the Caltrans Permit Inspector for a pre-job meeting prior to starting work within the State right of way may result in the immediate termination of work at the site. The State right of way shall be restored to a safe condition and all personnel and equipment must be removed from the State right of way as soon as possible as directed by the Caltrans Representative. Work may resume once the meeting with the Caltrans Permit Inspector has taken place and the Caltrans Permit Department has determined that the work is in compliance with the provisions of this permit.
4. Failure to comply with the permit provisions may result in the revocation of this permit (See Encroachment Permit General Provision number 2.) and will also result in more stringent permit requirements for future encroachment permits.

### **PERMITEE AND PERMITEE'S PRIME CONTRACTOR(S)**

Notwithstanding Encroachment Permit General Provision #4, the Permittee and Permittee's prime contractor(s) are required to complete, sign, and submit the

attached **Encroachment Permit Applicant: Contractor(s) Authorization Form DOT TR-0429**, prior to the pre-construction meeting, to the Caltrans Permit Inspector.

1. The form must reference permit number **05-23-N-UT-0121**.
2. A California licensed contractor, individual, or company under contract directly with the Permittee is considered a prime contractor for this encroachment permit.
3. **Each prime contractor must provide a certificate of liability insurance and an additional insured endorsement** to cover the State's potential liability for the permitted work and the issuance of the permit rider. The certificate and endorsement must name **"the State of California, California Department of Transportation, the directors, officers, employees, and/or agents of the State of California and/or the California Department of Transportation"** as additional insured for the following minimum liability insurance limits:

\$2,000,000.00	General Liability Aggregate
\$1,000,000.00	General Liability per Occurrence
\$100,000.00	Non-Owned Vehicle Property Damage

The Certificate must contain "Permit Number 05-23-N-UT-0121" in the description of the Certificate.

4. If prime contractor(s) are replaced or added after the initial submission of Form DOT TR-0429, Permittee and Permittee's new prime contractor(s) must complete, sign, and submit another form with signatures to the Caltrans District 5 Encroachment Permits Office.
5. Work within the State right of way may not begin until the receipt and approval of Form DOT TR-0429 by the Caltrans Permit Inspector and the required information listed below from the prime contractor(s) has been approved with a permit rider by the Caltrans District 5 Encroachment Permits Office.

**The Permittee or Permittee's prime contractor is also responsible to provide the following information as a permit rider application package for this permit.**

Permit rider applications also use the Standard Encroachment Permit Application DOT TR-0100. The permit rider applicant must be the Permittee of this permit and must reference this permit number, 05-23-N-UT-0121, in the description of work. The Permittee or Permittee's prime contractor may submit the permit rider application package. If the prime contractor will be acting as an agent on the Permittee's

behalf for the permit rider, a letter of authorization from the Permittee to the Permittee's prime contractor to apply and obtain the permit rider must be provided.

- A. The prime contractor responsible for the permit project traffic control must provide the project specific traffic control plans prepared, stamped, and signed, with the license expiration date, by a California Civil Engineer.**

**CONTRACTED SURVEYOR**

(For requested georeferenced 3D-vector electronic file As-built plans)

If the surveyor or surveying company is acting as a prime contractor, then they must be included on Form DOT TR-0429.

**The Permittee's surveyor should be capable to provide the following data in compliance with Project Completion As-Builts requirements identified in this permit:**

- A. A survey of any proposed City of Guadalupe's underground utilities during installation or exposed by potholing within the proposed underground utility installation limits. Survey shall include all alignment control points and at 200-foot intervals along the alignment.**
- B. If trenchless installations tracking control cannot provide the accuracy required of the As-Builts, a survey of the installed utilities at 200-foot intervals and at all alignment control points by potholing will be required.**
- C. A survey of the existing City of Guadalupe's underground utility alignments, outside of pavement and exposed by potholing, within the proposed underground utility installation limits. Survey shall include all alignment control points and at 200-foot intervals along the alignment.**
- D. Provide a survey of existing utilities potholed for positive location in the course of the installation of the utility work authorized by this permit.**

**Surveyor must provide evidence of a minimum of \$1,000,000.00 in general liability insurance coverage.**

The application and information for the permit rider application package may be mailed or delivered to the following address, or sent by email to [D5.Permits@dot.ca.gov](mailto:D5.Permits@dot.ca.gov)

Attention: VALERIE BEARD, PE  
50 Higuera Street  
San Luis Obispo, CA 93401

Any questions concerning the permit rider application package should be directed to Marshall Etrata at (805) 903-3499 or sent by email to Marshall.Etrata@dot.ca.gov.

### **NOTIFICATIONS**

#### **Notice of Materials Used**

Permittee's attention is directed to the **Caltrans Standard Specification Section 6, Control of Materials.**

The Permittee must bear all costs for source material inspection. Please note that these materials may require source inspection and approval at the manufacturer's plant.

Permittee shall be solely responsible to furnish a list of materials to be used on the permitted project by completing the attached Form CEM-3101 "Notice of Materials Used" for traffic signal standards, lighting (electrolier) standards, metal poles, mast arms, foundation bolts, overhead sign trusses, guard rail components, column casings, epoxy coated rebar, reinforced concrete pipe, steel girders, sign panels, and other items as specified by the State representative. Form must be submitted to the Caltrans Permit Inspector and METS Material Administrator.

The METS Material administrator must determine which materials will require source inspection and which will require onsite inspection in coordination with the Caltrans Permit Inspector. Additional form submissions may be required to address additional items that require source inspection.

Please allow a minimum of six weeks for source inspection, testing, and approval of materials to be used.

Reference attached form CEM-3101 for email address, fax number, and mailing address for submission to the METS Material Administrator.

### **TRAFFIC CONTROL AND PUBLIC SAFETY**

All traffic control must be performed under the direction of qualified and competent traffic control personnel. If it becomes apparent to the Caltrans Permit Inspector that the Permittee's contractor does not have adequately trained and competent

staff to perform traffic control, the Permittee or Permittee's contractor must hire a suitable contractor to provide traffic control.

Traffic control and construction zone signing must be performed per an approved traffic control plan.

In the absence of a project specific traffic control plan:

All traffic control must be performed in compliance with the applicable Caltrans Standard Plans for traffic control, California Manual on Uniform Traffic Control Devices, or as approved by and as directed by the Caltrans Permit Inspector,

or

If requested by the Caltrans Permit Inspector, Permittee or Permittee's contractor must provide a traffic control plan prepared by a duly licensed individual for review and approval. Plans must bear the licensed individual's signature and identifying licensing information.

All traffic control personnel performing flagging operations must be trained and follow the provisions listed in Caltrans Standard Specifications 12-4.02C(9) through 12-4.02C(11). Certification of training must be provided if requested by the State Permit Inspector.

All traffic control devices must comply with the current California Manual of Uniform Traffic Control Devices.

The Permittee must provide all traffic control devices and personnel. All expenses incurred from traffic control operations must be borne by the Permittee.

Work must not interfere with traffic and no equipment must be parked on or operated from the traveled way unless approved by the Caltrans representative.

Notwithstanding lane closures noted in the traffic control plans or elsewhere in this permit, the full width of the traveled way must be open for use by public traffic on Saturdays, Sundays, designated legal holidays, the day preceding designated legal holidays, after 3:00 PM on Fridays, and when construction operations are not actively in progress.

On multilane roadways, a minimum of one-paved traffic lane, not less than 10 feet wide, must be open for use by public traffic in each direction of travel.

On 2-lane, two-way roadways a minimum of one-paved traffic lane not less than 10 feet wide must be open for use by public traffic. When construction operations are not actively in progress, not less than 2 of these lanes must be open to public traffic.

If approved by the State Inspector, one lane may be closed during construction and public traffic stopped for periods not to exceed 5 minutes. After each closure, all accumulated traffic must be allowed to pass through the work before another closure is made. Lane closures must not exceed 0.5 mile in length.

Minor deviations from the requirements of this section concerning hours of work may be permitted upon the written request of the Permittee if, in the opinion of the Inspector, public traffic will be better served, and the work expedited. The Permittee must not adopt these deviations until the Inspector has approved them in writing.

“NO PARKING” zones must be posted a minimum of 48 hours in advance of proposed parking lane closure.

**Standard Specification 12-4.02C(4) Buffer Lanes**

Where two or more lanes are adjacent to a work area, including work on shoulders, you must close the lane adjacent to the work area in accordance with the lane closure requirements as follows:

1. Work is on the traveled way within 6 feet of the adjacent traffic lane.
2. Work is off the traveled way but within 6 feet of the edge of the traveled way, and the posted speed is 45 mph or greater.
3. Work is off the traveled way but within 3 feet of the edge of the traveled way, and the posted speed is less than 45 mph.

Closure of the adjacent traffic lane is not required for:

1. Workers protected by a permanent or temporary barrier
2. Installation, maintenance, or removal of traffic control devices except for temporary barrier system

For time periods at the beginning or end of work when the lane requirement charts do not allow the closure of the adjacent traffic lane, the following construction activities are allowed without a buffer lane:

1. Paving



2. Parking, positioning, loading, unloading vehicles, or storing equipment or materials necessary for the work being performed
3. Placing, removing or maintaining traffic stripes, pavement marking, or pavement markers
4. Operations not performed by workers on foot such as grinding, grooving, planing, sweeping, applying a tack coat, or operating a crane
5. Operations where workers on foot are protected, at each work location, within the same closure by an impact attenuator vehicle in the lane adjacent to live traffic

Do not perform work activities or store equipment, vehicles, or materials within the buffer lane.

#### **Suspended Loads**

Suspended loads or equipment must not be moved nor positioned over public traffic or pedestrians.

#### **Portable Changeable Message Sign**

Permittee must furnish portable changeable message signs (PCMS) conforming to State Standard Specifications **Section 12-3.32, "Portable Changeable Message Signs"** and the California Manual on Uniform Traffic Control Devices.

If edge of PCMS sign panel or PCMS extends into the paved shoulder, provide a standard shoulder closure per Caltrans Revised Standard Plan RSP T10.

When PCMS message is no longer needed to inform the traveling public of construction activities, the PCMS must be removed from the State highway right of way, or the PCMS display board must be rotated away from view of the traffic lanes and shut off.

### **GENERAL REQUIREMENTS**

#### **Project/Work Site**

All disturbed areas must be restored to original or better condition.

Any change in the existing drainage pattern, whether occasioned by increase or diversion, and the cost of damage, repair, or restoration of the State highway right of way must be the responsibility of the Permittee.

No earth or construction materials are to be dragged or scraped across the highway pavement. No excavated earth shall be placed or allowed to remain at a location where it can be tracked on the highway traveled way, public, or private approach by the Permittee's construction equipment or by traffic entering or leaving the highway traveled way. The Permittee must immediately remove excavated earth or mud so tracked onto the highway pavement or public or private approach.

No excavation, maintenance hole, pull box, or vault shall be left open overnight or unattended during work hours without written permission from the Caltrans representative and adequate protection for traffic and pedestrians is provided.

Any earthwork, excavation and embankments must conform to **Caltrans Standard Specifications Section 19, Earthwork.**

Any clearing and grubbing must conform to **Caltrans Standard Specification Section 17-2, Clearing and Grubbing.**

All newly placed concrete must be cured in accordance with **Caltrans Standard Specifications Section 90-1.03B, Curing Concrete.**

#### **Pipe Abandonment**

Pipes to be abandoned must be removed from the State right of way where practical or abandoned as directed by the State Inspector.

Facilities made of or containing hazardous materials (such as asbestos) must be removed in accordance with the "Hazardous Materials and Hazardous Waste Management Special Provisions" (TR-0408).

Culverts and pipelines must not be abandoned until their use is no longer required. The Permittee must notify the engineer in advance of any intended culvert or pipeline abandonment.

Resulting openings into existing structures that are to remain in place must be plugged with concrete conforming to the provisions in **Section 90-2 "Minor Concrete,"** of the Caltrans Standard Specifications.

Abandoned culvert and pipelines must be filled with sand, Caltrans two-sack slurry cement, or controlled low strength material which meets the Caltrans Standards to completely fill the pipe. Sand backfill material must be clean, free draining, and free from roots and other deleterious substances.

Pipes to be abandoned in place must be surveyed and the Permittee must submit "As-Built" plans to the State Inspector showing the actual location of the abandoned facility to the nearest 0.1-foot horizontally and vertically. Plans must be stamped "As-Built" and signed by the Permittee's representative who was responsible for overseeing the work. Work shall be considered incomplete until the receipt of the "As-Built" plans.

In addition to the As-built plans, an electronic as-built file must be provided in a 3D vector file format and must be georeferenced to the current State plane coordinate system used by Caltrans based on a minimum of two Caltrans survey monuments on the same coordinate system with vertical control data. See Survey Monumentation provisions of this permit for contact information to obtain Caltrans survey control monument data. GPS surveys must comply with the calibration requirements in Chapter 6 of the Caltrans Surveys Manual.

#### **Curbs, Gutters, Sidewalk, and Asphalt Concrete Dike**

Sidewalk/accessible path construction with grades or dimensions that exceed the maximum allowed values per the Americans with Disabilities Act (ADA), State Standards Plans and Specifications, and Caltrans requirements is not acceptable and will require reconstruction to bring the facility into compliance.

Curb, gutter, and sidewalk construction must comply with Caltrans Standard Specification **Section 73, Concrete Curbs and Sidewalks**.

New sidewalk, curb and gutter concrete must be doweled as follows or as directed by the State Inspector. New concrete must be doweled into existing adjacent concrete with minimum of 12 inches #4 smooth bars equally embedded, at 24-inch centers and 6 inches from the concrete edge, or as directed by the State Inspector. A minimum of one longitudinal bar must be doweled into each, the curb and in the gutter. One end of each bar must be greased or sleeved. Concrete sidewalk must not be doweled into the curb and gutter.

New curb and gutter installations must be State standard type A2-6, unless necessary to conform to existing adjacent curb and gutter installations or noted elsewhere on the approved plans.

New curb and gutter must be constructed to drain properly without ponding.

Where curbs exist, the driveway structural section must be a minimum of 6 inches of Portland Cement Concrete (PCC) over 6 inches of Class 2 aggregate base.

Removal of PCC Sidewalks or Curbs: sidewalks or curbs must be saw cut to the nearest score marks and replaced equal in dimension to that removed with score

marks matching existing adjacent sidewalk or curb.

Existing curb and gutter may be sawcut at lip of gutter if the curb and gutter can be removed without disturbing the existing pavement structural section. New curb and gutter concrete must be poured neat to the existing pavement and must match the elevation of the existing pavement.

Effort must be made to retain the existing pavement adjacent to new concrete work. If the Caltrans Permit Inspector determines that the existing pavement was damaged, or if the pavement was removed to facilitate the curb, gutter or driveway improvements, then the existing pavement must be repaired or replaced in kind directed by the Caltrans Permit Inspector. Limits of roadway pavement repair or replacement shall be determined by the Caltrans Permit Inspector to meet field conditions and must be a minimum of 3 feet from the flowline of the curb or lip of gutter.

All newly placed concrete must be cured in accordance with the provisions of **Section 90-1.03B, "Curing Concrete,"** of Caltrans Standard Specifications.

AC dikes must be removed by saw cutting to a neat line and replaced in kind per State Standard Plans A87B or as directed by the State Inspector. Asphaltic binder and aggregate size for AC dikes must conform with Caltrans Standard **Specification 39-2.01B (11), Miscellaneous Areas and Dikes.**

#### **Access Holes, Pull Boxes and Valve Boxes**

Access holes must conform to State Standards unless local standards exceed that of the State.

Access holes, valve boxes and pull boxes must be located as far as practical from the roadway as to minimize impact to traffic when accessed.

Access holes, valve boxes and pull boxes should not be placed in the traveled way or paved shoulders.

Access holes placed in graded dirt shoulders must be set flush with finished grade, and a minimum 1-foot-wide minor concrete collar must be constructed around the manhole as directed by the State Inspector.

Access holes, valve boxes and pull boxes must not be located where there is a break in grade between the pavement, gutter, curb ramps or in major traffic lanes of a cross street.

All access holes, valve boxes and pull boxes must have traffic-rated covers and

must be constructed flush with the adjacent surface.

All access hole, valve box and pull box covers must fit into their frames without rocking.

### **Pavement Delineation and Markings**

Traffic stripes and pavement markings to be removed must be removed at the locations shown on the plans and at the locations designated by the Engineer.

Traffic stripes and pavement markings must be removed by any method that does not materially damage the existing pavement. Pavement marking images must be removed in such a manner that the old message cannot be identified. Where grinding is used, the pavement marking image must be removed by grinding a rectangular area. The minimum dimensions of the rectangle must be the height and width of the pavement marking. A minimum of a Caltrans Micro-surfacing may be required to correct any imperfections to the pavement as directed by the Caltrans Inspector.

Residue resulting from removal operations must be removed from pavement surfaces by sweeping or vacuuming before the residue is blown by the action of traffic or wind, migrates across lanes or shoulders, or enters drainage facilities.

The removal of yellow pavement delineation may contain lead. Permittee shall be responsible to have the waste material tested for the concentration of lead. The Permittee, for work performed under an encroachment permit project, shall be the generator of the hazardous material and is solely responsible to properly process and dispose of the lead laden waste material at no cost to the State.

All striping and pavement markings, unless otherwise noted on the approved plans or permit, must be applied in thermoplastic material in conformance with **Caltrans Standard Specifications Section 84, MARKINGS**.

Permittee or Permittee's contractor must coordinate with the Caltrans Permit Inspector to document all existing pavement delineation and markings that may be obscured or removed during the pavement rehabilitation process. All existing pavement delineation and markings must be replaced in kind and at the same location.

### **Paving - Type A Hot Mix Asphalt (Type A HMA)**

The structural section of the new pavement should have been determined in accordance with pre-project R-value tests of the soil and the Traffic Index value for that portion of roadway as shown on the approved plans and must be no less than the adjacent pavement. If any question should arise concerning the R-values and

Traffic Index values, the Caltrans Permit Inspector shall make the final determination regarding which values will be used.

If basement soils differ from the anticipated site conditions, the Caltrans Permit Inspector may request R-value verification tests at spot locations at no cost to the State.

Once excavation has been initiated to place a structural section for pavement replacement, complete excavation, placement of structural base courses, and paving must be performed in succession and continuously, without delay, until completed.

Newly placed asphalt concrete roadway pavement or shoulder paving must have a minimum width of 3 feet or as directed by the State's inspector to allow a roller compactor to compact the roadway section without contact over existing surfaces. Pavement or shoulder sawcutting to acquire the 3 feet minimum width must be done radial to or perpendicular to the lip of curb, curb face, edge of pavement, centerline or as directed by the State Inspector.

Asphalt concrete must be Type A HMA,  $\frac{1}{2}$ ,  $\frac{3}{4}$ , or 1-inch aggregate gradation, and must conform to the specifications in **Section 39, "Asphalt Concrete"**, of the Caltrans Standard Specifications.

The placement and use of asphalt concrete products, which includes but not limited to, asphalt, aggregate, pavement reinforcing fabric, storage, drying, proportioning, mixing, subgrade preparation, prime coat, paint binder (tack coat), spreading and compacting must comply with Caltrans Standard Specifications – **Section 39, "Asphalt Concrete"**.

The area to which paint binder has been applied must be closed to public traffic. Care must be taken to avoid tracking binder material onto existing pavement surfaces beyond the limits of construction.

A drop-off of more than 0.15 feet will not be allowed at any time between adjacent lanes open to public traffic.

At the end of each working day if a difference exists between the elevation of the existing pavement and the elevation of any excavation within 15 feet of the traveled way, material must be bladed up and compacted against the vertical cuts adjacent to the traveled way. During excavation operations, native material may be used for this purpose; however, once the placing of the structural section commences, structural material must be used. The material must be placed to the level of the top of existing pavement and tapered at a slope of 4:1 (horizontal:

vertical) or flatter to the bottom of the excavation.

### **Open Trench Pavement**

The clearance and offset requirements for new utility installations within existing or ultimate State Highway rights of way must meet the following minimum clearances along the alignment of the facility:

1. 42 inches below the finished grade or 18 inches below the grading plane of a currently planned project, whichever distance is greater
2. 12 inches below existing or future drainage structures, but not less than the requirements identified in item 1 above
3. 30 inches below the flow line of unlined ditches
4. 24 inches horizontally from the face of piles
5. 24 inches horizontally from the side of the planned excavation
6. 36 inches below concrete sidewalks, where future widening of the street in the sidewalk area is not anticipated.

Trench back fill and paving must comply with the attached "Encroachment Permit Trench Detail (TR-0153)" or as directed by the Caltrans Permit Inspector to meet field conditions.

All existing AC must be saw cut to a minimum width of 3 feet, over the trench, to allow for a roller compactor to properly compact the AC.

Pavement grinding must be performed to accommodate a uniform overlay for the final trench paving. See attached diagram "Limits of Grind and Overlay for Pavement Replacement."

A minimum grind depth of 2.0 inches is required when using Type A HMA, ½ inch aggregate gradation, or a minimum grind of 2.5 inches is required when using Type A HMA, ¾ inch aggregate gradation.

All trench paving must be constructed per Caltrans Standard Specifications.

Standard Specification 86-1.02B(1); Conduit for fiber optic cable systems, when not using trenchless technologies, must be schedule 40 high density polyethylene, complying with NEMA TC-7

Tracer wire must be a minimum no. 12 copper conductor with orange insulation Type TW, THW, RHW, or USE. For direct burial, the tracer wire insulation must be Type UF.

During trenching operations, tree roots must be avoided whenever possible.

If excavation operations damage roots larger than 2 inches in diameter, roots must be cut cleanly with a saw.

If trenching operations damage more than 20% of a tree's roots, a certified Arborist must be consulted and must submit a mitigation recommendation.

If tree roots are damaged on the highway shoulder, regional Caltrans Tree Maintenance Supervisor must be notified immediately.

If trees are damaged and must be removed for safety reasons, a mitigation plan must be submitted to the State Inspector for approval.

Backfill in trenches outside of the traveled way and shoulder area in the root zones must consist of native soil and must be compacted, using water, to a minimum 90% relative compaction or as directed by the State Inspector.

Erosion control must be applied whenever trenching occurs in unpaved areas.

A Caltrans micro-surfacing Type III may be required over the entire roadway within the project limits as directed by the Caltrans Permits Office or Caltrans Permit Inspector to provide a smooth and uniform color pavement surface prior to installing final pavement delineation and markings.

### **Saw Cutting Existing Pavement**

Where proposed pavement matches existing roadway pavement, saw cutting of existing pavement must produce a clean, competent pavement edge to join proposed and existing pavement. Pavement edge at the saw cut line must be free of defects including cracks, separated aggregate, or failed structural roadway sections.

Saw cut locations may need to be extended further into the limits of the existing pavement as necessary to obtain a competent pavement edge. The resulting, conform joint must not occur within a wheel track and may require a pavement grind and overlay to conceal the joint.

The Caltrans Permit Inspector must be consulted to determine if a saw cut location is acceptable.

All conform locations in open cuts or where proposed paving meets existing paving must be saw cut to a neat line the full depth of the pavement with a power-driven saw or rock cutting excavator before removing any surfacing. The surfacing to remain in place must not be disturbed or displaced by cutting or removal methods



employed.

### **Excavation Protective Systems**

If required, Permittee or Permittee's contractor must provide an excavation protective system in compliance with California Code of Regulations, Title 8 – Industrial Relations, Division 1 – Department of Industrial Relations, Chapter 4 – Division of Industrial Safety, Subchapter 4 – Construction Safety Orders (Construction Safety Orders); for the protection of personnel in excavations and to preserve the stability of the roadbed and other structures.

### **Shoring Plan Reference:**

Caltrans "Trenching and shoring Manual" is available at the following website:

<http://www.dot.ca.gov/hq/esc/construction/manuals>

The contractor may elect to use the Construction Safety Order Details. It is not required that a Professional Engineer prepares the plan. However, a plan is still required. This plan can be a letter to the State Permit Inspector containing the information outline in Section 2.0 "Shoring Plan Submittal" in Chapter 2 of the Caltrans Trenching and Shoring Manual (second paragraph of Section 1.6, page 1-9)

Shoring that does not meet the Construction Safety Orders must be designed by a California Registered Civil or Structural Engineer. The Engineer is required to stamp, sign, and provide the expiration date of their license on the shoring plan.

### **Personnel Protective/Safety Equipment**

All personnel working within the State right of way must wear the appropriate personnel safety/protective equipment as specified by the personnel's employer's "Injury and Illness Prevention Program" required by the California Code of Regulations 3203. If requested by the Caltrans Permit Inspector, personnel's employer must provide a copy of said "Injury and Illness Prevention Program" and identify the locations within the document that addresses, but not limited to, personal protective equipment, head protection, and warning garments.

In the absence of an "Injury and Illness Prevention Program," all other personnel within the project work zone must conform to the personnel protective/safety equipment requirements in the latest edition of the Caltrans Safety Manual.

### **Aerially Deposited Lead (ADL) for Minimal Disturbance**

Permittee must reuse the soil within the work limits in the immediate area from which it was excavated. If any excess soil is generated, it becomes the property of the Permittee. Permittee must transport all excess soil outside of Caltrans' right-of-way and dispose of it in accordance with all applicable environmental laws and

regulations.

**Construction Debris and Waste Materials**

The Permittee solely owns all construction debris and waste materials, including hazardous waste, generated by this permitted project. Said materials must be removed from the State right of way, stored, and disposed of in accordance with applicable local, regional, State, and Federal specifications or regulations. Construction debris and waste materials must be disposed of:

at designated off-site commercial facilities approved to accept said materials,

at non-commercial permitted sites approved to accept said materials (Permittee must provide copies of all necessary local and State agency permits prior to disposal.),

or at sites outside of the State of California approved to accept said materials (Permittee to provide copies of permits issued by the local and State agency with jurisdiction over the site prior to disposal.).

If requested by the State Permit inspector, Permittee must provide a copy of documentation as proof of the proper disposal of said materials.

**Survey Monumentation**

Permittee's attention is directed to **Caltrans Standard Specifications Section 5-1.36, Property and Facility Preservation** and "Professional Land Surveyors' Act," Section 8771 of the State of California Business and Professions Code. Permittee must physically inspect the work site and locate survey monuments prior to work commencement. Monuments that might be disturbed must be referenced or reset in accordance with the standards mentioned above.

If feasible, monuments should not be set within the traveled way. All monuments that must be set or perpetuated in paved surfaces must be constructed in accordance with **Caltrans Standard Specifications Section 78-2, Survey Monuments**, and Caltrans Standard Plan A74, Type D, or equal with prior approval of the District Surveys Engineer.

Copies of Corner Record files or Record of Surveys recorded in compliance with the Business and Professions Code must be forwarded to the Caltrans District 5 Surveys Engineer at the following address:

Caltrans District 5  
Survey Section  
Attn: Jeremy Villegas  
50 Higuera Street  
San Luis Obispo, CA 93401

Phone: (805) 550-0861  
Email: jeremy.villegas@dot.ca.gov

### **Surveys**

**This permit does not authorize work on freeways, expressways, or access-controlled highway rights of way. Work on these types of highway facilities must be the subject of a permit rider or a separate permit for each request or site location.**

**Traffic control and traffic control signage for each survey site must be determined by and approved by the State Inspector prior to starting work.**

All survey operations must be conducted off the traveled way except where necessary to cross pavements and medians.

When survey operations are being conducted, the permittee must furnish, place, and maintain signs and safety equipment in accordance with the latest edition of the Caltrans Survey Manual, Caltrans Manual of Traffic Controls for Construction and Maintenance Work Zones, and California Manual on Uniform Traffic Control Devices.

All personnel must wear hard hats and warning garments in the appropriate color (fluorescent/reflective versions). Work must be done during daylight hours only.

Unless specifically authorized in this permit, markings within the right-of-way must be temporary. Any painted markings must be made with water-soluble paint, and other markings must be removed upon completion of the survey.

Electromagnetic and radioactive equipment must be operated by certified personnel and must not interfere with radio communications or be directed toward the traveling public.

Permission is also granted to park survey vehicles temporarily within the right of way, outside the shoulders, while survey work is in progress. Auxiliary support and employee vehicles must remain outside of the right of way.

Survey information and assistance may be obtained upon request to:

Caltrans District 5 Permit Provisions  
City of Guadalupe  
05-23-N-UT-0121  
05-SB-1-49.95  
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Department of Transportation  
Survey Section  
Attn: Jeremy Villegas  
50 Higuera Street  
San Luis Obispo, CA 93401

Phone: (805)549-3066  
Email: jeremy.villegas@dot.ca.gov

If feasible, monuments should not be set within the traveled way. All monuments that must be set or perpetuated in paved surfaces must be constructed in accordance with Caltrans Standard Specifications, **Section 78-2, "Survey Monuments,"** and Standard Plan A74, Type D, or equal with prior approval of the District Surveys Engineer.

Any survey data requested by or furnished to Caltrans must be provided without charge.

Copies of Corner Records or Records of Surveys, recorded in compliance with the Business and Professions Code, must be forwarded to the District Surveys Engineer.

Measurements across traffic lanes must be made with electronic distance measuring devices utilizing non-visible light or other optical means.

Permittee must provide for the safe passage of pedestrians and bicyclists.

This permit does not authorize removal, cutting, trimming or damage to any tree, shrub, or plant within the highway right of way.

Unless specifically authorized elsewhere in this permit, excavation of holes in paved surfaces is prohibited.

Any permitted excavations must be backfilled in accordance with State standards and as directed by the State's representative.

When on the State Highway system, use W21-6 "Survey Crew" sign prior to survey area per the Caltrans Standard Plan T9 advance warning sign spacing or under the guidance of the Caltrans Permit Inspector.

**Unmanned Aircraft Systems (UAS)**

Unless specifically authorized in this permit, UAS operations within the State right of way requires prior written approval from the District Encroachment Permits Office.

UAS operations must comply with Caltrans UAS Operations Handbook.

### **Material Testing**

Material testing and quality control must conform to the State Construction Manual and to the State Material Testing Manual. Testing must be performed by a certified material-testing consultant acceptable to the State and paid for by the Permittee. Material testing and quality control tests must be performed as required by the State's Inspector and the results thereof must be made immediately available.

All required construction compliance tests must be performed with the California Test Methods and must be in accordance with the latest edition of Caltrans Independent Assurance Program Manual. A Caltrans certified laboratory must also perform all tests and all laboratory reports must be furnished to the Department's representative at no cost to the State.

### **Backfill Requirements**

All backfilling and compaction must conform to the applicable sections of the **Caltrans Standard Specifications Section 19-5, Compaction.**

Backfilling using ponding or jetting methods are prohibited.

Caltrans Standard Specification 2-sack slurry cement should be used for backfilling under all paved surfaces to expedite roadway repairs.

All backfill material must comply with and must be constructed per Caltrans Standard Specifications.

Backfill material must be approved by the Caltrans Permit Inspector prior to beginning excavation.

Culverts with less than 2 feet of cover must be backfilled as directed by the State Inspector with minor concrete conforming to **Caltrans Standard Specifications Section 90-2.**

### **Relative Compaction (90 Percent)**

Embankment compaction beyond the roadbed or outside of structure backfill must not be less than 90 percent relative compaction unless stated otherwise in the Caltrans Standard Specifications or Caltrans Highway Design Manual.

### **Relative Compaction (95 Percent)**

Relative compaction of not less than 95 percent must be obtained for a minimum depth of 0.5-foot below the grading plane for the width between the outer shoulders, whether in excavation or embankment.

In addition, relative compaction of not less than 95 percent must be obtained for a minimum depth of 2.5 feet below the finished grade for the width of the traveled way plus 3 feet on each side thereof, whether in excavation or embankment.

For limits of 95 percent compaction of embankment adjacent to abutments and for retaining walls without pile foundations reference **Caltrans Standard Specifications Section 19-5.03B**.

### **Existing Trees and Vegetation**

Unless stated elsewhere in this permit or shown on the approved permit plans, this permit does not authorize the removal, severing of roots or trimming of vegetation. If work of this nature is required, a written request and approval, by the Caltrans Permit Inspector, is required in advance of performing the work. Replacement planting may be required as a mitigation measure. Excavations should be done outside of drip line to reduce tree damage and integrity of trees. If excavations must be made within the drip line of trees (or extending tree roots) along the right of way, the trenches must be hand dug and the utility routed beneath or around root structure. Major tree roots must not be cut or damaged. Additionally, the exposed roots must be wrapped and kept moist until the excavation is back filled with the native material. Requests for exceptions must be accompanied by an Arborist's recommendation.

### **Archaeological/Cultural Requirements**

If archaeological resources or human remains are accidentally discovered during construction, work must be halted within 150 feet of the find until a qualified professional archaeologist can evaluate it. Permittee must notify Caltrans District Archaeologist Kristin Hadick, (805) 458-1238, about the discovery immediately. If the find is determined to be significant, appropriate mitigation measures must be formulated and implemented.

### **Signs**

Installation of roadside signs must comply with all applicable portions of the current **Caltrans Standard Specifications Section 56-3**, Caltrans Standard Plans, California Manual on Uniform Traffic Control Devices, and Caltrans policies.

If exact locations of roadside and construction area signs are not shown on the project plans, post holes must be dug by hand, except where potential conflicts can be eliminated. Potential conflicts are considered eliminated when an appropriate regional notification center has performed field mark-out and no subsurface utilities are within 4 feet of the proposed post hole, or the post hole can be moved 4 feet away from subsurface utilities as located by the utility owner.

Temporary and permanent signs placed within the State right of way must comply with minimum retro-reflectivity requirements of the most current of the following: Federal Highway Administration Manual on Uniform Traffic Control Devices - Section 2A.08, **Caltrans Standard Specifications Section 82-2.02C, Retroreflective Sheeting.**

Roadside signs mounted on post(s) must be placed at locations shown on the permit plans and must be installed in compliance with the latest edition of Caltrans Standard Plan RS1 through RS4.

Temporary signs mounted on barricades and barricade/sign combinations must be crashworthy.

The bottom of a temporary sign mounted on a barricade, or other portable support, must be at least 1 foot above the traveled way or the existing surface at the location of placement.

Proposed sign placement must not interfere with the visibility of any existing warning, regulatory, information or guide signs along the State Highway.

Signs to be owned and maintained by the Permittee shall be appropriately marked on the back of the sign.

A safe pedestrian passageway width of 4 feet must be maintained at any sign installation in areas normally traversed by pedestrians. The minimum passageway adjacent to a drop off, such as a curb face or gutter must be at least 5 feet.

### **EXISTING FACILITIES**

Existing improvements must be protected or relocated as required by the work authorized by this permit. If existing improvements including pavement markings and delineation are damaged or their operation impaired by this work, they must be replaced or restored to the satisfaction of the Caltrans representative. Such work must be done immediately if requested by the Caltrans representative.

**IT SHALL BE THE PERMITTEE'S RESPONSIBILITY TO FULLY INVESTIGATE THE PROPOSED WORK AREA FOR POSSIBLE CONFLICTS WITH EXISTING UTILITIES AND FACILITIES, INCLUDING BUT NOT LIMITED TO SEWERS, ELECTRICAL CONDUCTORS, GAS LINES, WATER PIPES AND TRAFFIC SIGNAL FACILITIES. THE PERMITTEE AGREES TO ACCEPT ALL LIABILITY FOR DAMAGES DONE TO EXISTING FACILITIES CAUSED BY THE WORK AUTHORIZED UNDER THIS PERMIT.**

**Caltrans Traffic Signals, Lighting, and Electrical Facilities**

**Caltrans does not subscribe to underground utility locating services. It is the Permittee's sole responsibility to investigate, locate, and mark existing Caltrans traffic signal equipment, loops, conduits, and street lighting facilities prior to work in or between signalized intersections and street lighting facilities.**

If it is apparent that impacting traffic signal conduits during construction will be unavoidable Permittee must install temporary overhead wiring for the signal at Permittee's own expense. Permittee must always have on hand all necessary equipment and personnel needed to provide traffic control at an intersection should the traffic signal malfunction.

If a signal detector loop, including the portion leading to the adjacent pull box is damaged by Permittee's operations the entire detector loop must be replaced, in kind, within 24 hours of the occurrence. If an adjacent loop is damaged during the replacement, that loop must also be replaced. The Caltrans Inspector must be notified immediately when damage occurs. Arrangements for Caltrans Electrical operations staff must be made to have the traffic signal controller reprogrammed.

**Utility Relocations**

If existing public or private utilities conflict with the construction PROJECT, PERMITTEE will make necessary arrangements with the owners of such utilities for their protection, relocation, or removal. PERMITTEE must inspect the protection, relocation, or removal of such facilities. Total costs of such protection, relocation, or removal which STATE or PERMITTEE must legally pay, will be borne by PERMITTEE. If any protection, relocation, or removal of utilities is required, including determination of liability for cost, such work must be performed in accordance with STATE policy and procedure. PERMITTEE must require any utility company performing relocation work in the STATE's right-of-way to obtain a State Encroachment Permit before the performance of said relocation work. Any relocated utilities must be correctly located and identified on the as-built plans.

**WATER POLLUTION CONTROL**

**Discharge of Storm Water and Non-Storm Water**

Work within State highway right-of-way must be conducted in compliance with all applicable requirements of the National Pollutant Discharge Elimination System (NPDES) permit issued to the Department of Transportation (Department), to govern the discharge of storm water and non-storm water from its properties. Work must also be in compliance with all other applicable Federal, State and Local laws and regulations, and with the Department's Encroachment Permits Manual and encroachment permit. The Department's NPDES Permit requires the Permittee to



comply and maintain, if applicable, the approved Storm Water Special Provisions for Minimal or No Impact (TR-0400), Water Pollution Control Program, or Storm Water Pollution Prevention Plan.

The Contractor (permittee) must be responsible for fines assessed or levied against the Contractor or the Department as a result of the Contractor's (permittee) failure to comply with these provisions. Fines shall include civil liability fines, criminal penalties and/or damages, assessed, or levied against the Department or the Contractor, Contractor liability for failure to comply with these provisions shall also include reimbursement for payments made or costs incurred by the Department in settlement for alleged violations of the Permits, the Manuals, or applicable laws, regulations, or requirements. Costs incurred could include sums spent in lieu of fines or penalties, in mitigation or to remediate or correct violations.

**If an unforeseen illicit discharge is generated during construction activities and the Caltrans Permit Inspector cannot be contacted, the Permittee or Permittee's contractor must contact the Encroachment Permit Storm Water Coordinator, Rachel Naccarati (805) 534-3303 immediately. The Permittee or Permittee's contractor is responsible to contain and remediate the illicit discharge as directed by the Caltrans Permit Inspector or Encroachment Permit Storm Water Coordinator at no cost to the State.**

Unless stated otherwise in this permit, approved plan, or approved specifications, seeds sown for erosion control must achieve 70% germination over the disturbed soil area as determined by the Caltrans Permit Inspector.

The Caltrans Permit Inspector must approve the seed mix prior to its application.

### **PROJECT COMPLETION**

Once work authorized by this permit has started, cancelling the permit or failure to contact the Caltrans Permit Inspector may result in the forfeiture of any remaining fee deposits.

#### **As-Built Requirement**

Civil Engineer in charge must also complete, stamp, and sign the attached Certification of Compliance with Americas with Disabilities Act (ADA) form TR-0405. Form must be submitted with As-Built plans or with the Notice of Completion.

Upon completion of the project, the Permittee must submit "As-Built" plans to the State Inspector showing the actual location of the newly constructed facility to the nearest 0.1-foot horizontally and vertically. Plans must be stamped "As-Built", signed

and dated by, and contain the printed name of the Permittee's representative who was responsible for overseeing the work. Work shall be considered incomplete until the receipt of the "As-Built" plans.

Permittee shall provide an electronic Adobe file format (.pdf) "As-Built" plans. If this electronic file format is not available, a hard copy of the "As-built" plans shall be provided to the Caltrans Inspector or to the Caltrans District 5 Encroachment Permits Office.

Requested georeferenced electronic 3D-vector file As-Built plans:

Permittee is requested to provide the following electronic as-built files georeferenced to the current local State plane coordinate system used by Caltrans based on a minimum of two Caltrans survey monuments on the same horizontal datum noted below and a minimum of two Caltrans survey monuments with **NADV88** vertical datum. See attached Caltrans Survey Control and Centerline Reference Monuments Report and Survey Monumentation provisions of this permit for contact information to obtain Caltrans survey control monument data. GPS surveys must comply with the calibration requirements in Chapter 6 of the Caltrans Surveys Manual.

Electronic as built files must include the following:

1. 3D vector file electronic as-builts formats
  - a. MicroStation version 8i SS4 or CONNECT file (minimum submission)
  - b. Autodesk Civil 3D file (if available and identify version)
2. CSV (comma-separated value) file of reference monuments and utility point data

**Horizontal control =**  
**Vertical control = NAVD88**

Immediately following completion of the work permitted herein, the Permittee must fill out and send by email the Notice of Completion attached to this permit.

**THANK YOU!**

## **DISTRICT 5 NOTIFICATION REQUIREMENTS**

The following provisions shall apply to all permit work requiring temporary lane closures or traffic detours:

### **Temporary Lane Closures**

Notification of temporary lane closures or traffic detours shall be given to the State Inspector for his approval using copies of the attached form entitled, **WEEKLY TRAFFIC UPDATE**. Notification shall be submitted to the State Inspector by 12:00 PM (noon) Monday, prior to the week of the proposed closure or detour. Notifications submitted after the deadline cannot be approved for the upcoming week. **All traffic control requiring the temporary closure of lanes or detour of traffic shall be approved in advance by the State Inspector.**

### **Ramp Closures**

14 to 7 calendar days prior to an approved ramp closure, notice shall be posted at the ramp entrance using the appropriate SC6 sign. In addition, an SC8 or portable changeable message sign shall be posted for the preceding ramp the day of the closure unless otherwise approved by the Caltrans Permit Inspector.

### **Caltrans Lane Closure System (LCS) Compliance**

Work authorized by this permit may require compliance and proper notification in LCS.

If not identified elsewhere in this permit, you or your contractor must provide the contact information for two personnel, who will be ensuring LCS compliance during the pre-job meeting with the Caltrans Permit Inspector. Contact information shall include personnel's full names, phone numbers and email addresses.

You or your Contractor's LCS contact will be required to properly notify the District Traffic Management Center (TMC) as described below.

When a lane closure or lane shift has been identified by the Inspector with a Lane Closure ID # and Log #, you will be required to provide the TMC notification status when you are placing the lane closure, when you remove the lane closure, or when you cancel the lane closure.

When providing the status of the lane closure to the TMC you will need to follow these steps,

1. **Obtain the Lane Closure ID and Log # assigned for the approved scheduled lane closure event from the Caltrans Permit Inspector** a minimum of one weekday prior to the closure day or duration.
2. **Call the TMC/Lane Closure Phone Number (805) 549-3837 to provide the Lane Closure ID Status**

**For a stationary closure on a traffic lane, use code:**

1. 10-97 immediately before you place the 1st cone on the traffic lane
2. 10-98 immediately after you remove all of the cones from the traffic lane

**For a stationary closure on the shoulder, use code:**

1. 10-97 immediately before you place the 1st cone after the last advance warning sign
2. 10-98 immediately after you remove the last cone before the advance warning signs

**For a moving closure, use code:**

1. 10-97 immediately before the actual start time of the closure
2. 10-98 immediately after the actual end time of the closure

For closures not needed on the authorized date, use code 10-22 within 2 hours after the authorized start time.

When calling the TMC to provide the status on your lane closure you will say something to the effect of (substituting your lane closure ID number and Log number for example ID "P101CA" and Log number "1" below),

- **"1097"**- *"This is (your name, phone number) calling to provide a 1097 status to lane closure ID P101CA and log number 1. That is a 1097 for Papa 101 Charlie Alpha log number 1."*
- **"1098"**- *"This is (your name, phone number) calling to provide a 1098 status to lane closure ID P101CA, log number 1. That is a 1098 for Papa 101 Charlie Alpha log number 1."*
- **"1022"**- *"This is (your name, phone number) calling to provide a 1022 status to lane closure ID P101CA, log number 1. That is a 1022 for Papa 101 Charlie Alpha log number 1."*

Failure to properly status the lane closures will result in a written warning by the Caltrans Permit Inspector on the first violation. If there is a 2nd violation, your permit may be suspended until a Contractor or new Contractor (C-31 or General Engineering A License preferred) who is experienced in traffic control and LCS notification is hired. Additional violations will result in the revocation of the permit and may impact the processing of future encroachment permit application packages.

You can check your lane closure status at the following website:

<https://lcswebreports.dot.ca.gov/>

### **Special Notifications**

If permitted activities such as road closures or traffic detours may result in significant traffic congestion, Permittee shall be responsible for coordinating advance notification to local newspapers, television and radio stations, and emergency response providers with both the State Inspector and the Caltrans Public Information Officer, telephone (805) 549-3237. Public notice may include press releases and/or traffic signing.

Permittee shall complete and submit the attached form entitled **PUBLIC AFFAIRS – PERMITTED ACTIVITY NOTIFICATION** to the Caltrans Public Affairs Office as early as possible (One Week Ahead is Best) prior to beginning of permitted activity. Additional information or clarification may be required in the form of a written description of the activities in a format that is suitable for a press release. The form may be delivered by fax to (805) 549-3638 or emailed

to the PIO contact on the form.

**Horizontal and Vertical Requirements for Extra-Legal Load Vehicles**

Permittee shall provide written notification to the Caltrans Permit Inspector or Caltrans Representative, of proposed horizontal or vertical lane restrictions which will affect extra-legal loads up to 16' wide and 18' high, or ramp closures/re-openings that may affect extra-legal loads traveling through the project area. Said notification shall be delivered to the Inspector no fewer than 25 days prior to proposed change. Permittee shall immediately notify the Caltrans Permit Inspector or Caltrans Representative as soon as the restriction is no longer present.



# WEEKLY TRAFFIC UPDATE

## PERMITS

For the Week of: \_\_\_\_\_

Please provide this form to your designated **PERMIT INSPECTOR** each week if you will be performing work that will impact traffic (lane closures, ramp closures, shoulder closure, traffic control, etc.)

**Weekly Traffic Updates must be received by Monday 12:00 PM (noon) the week prior to the requested date(s) of the planned traffic control. Failure to meet the deadline may result in the denial of the requested traffic control.** The State Permit Inspector may also require changes to the requested traffic control prior to its approval.

We appreciate your cooperation. These updates need to be done in a timely manner to provide information to the traveling public we serve. THANKS!!!!

DATE	TIME (begin / end)	Location – Cross Streets, County Route, and Post Mile (from / to)	Impact on Traffic (Description)	Reason

Send, fax, or email to: **Your PERMIT INSPECTOR - Payman Hamed, Fax #: , Email: payman.hamed@dot.ca.gov**

Your Name: \_\_\_\_\_

Phone: \_\_\_\_\_ FAX: \_\_\_\_\_

Company/Dept.: \_\_\_\_\_

Email: \_\_\_\_\_

PERMIT #: **05-23-N-UT-0121**

## 2024 Holiday and Special Day Lane Closure Restrictions

For maintenance, permits, and projects using blanket chart hours

January						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February						
Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29		

March						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

April						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

May						
Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

June						
Su	Mo	Tu	We	Th	Fr	Sa
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

July						
Su	Mo	Tu	We	Th	Fr	Sa
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

August						
Su	Mo	Tu	We	Th	Fr	Sa
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

September						
Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

October						
Su	Mo	Tu	We	Th	Fr	Sa
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

November						
Su	Mo	Tu	We	Th	Fr	Sa
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

December						
Su	Mo	Tu	We	Th	Fr	Sa
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2		

<u>Designated Holidays</u>	<u>Date observed</u>
New Year's Day	January 1st
Presidents' Day	3rd Monday in February
Memorial Day	Last Monday in May
Independence Day	July 4th
Labor Day	1st Monday in September
Veterans Day	November 11th
Thanksgiving Day	4th Thurs and Fri in November
Christmas Day	December 25th
<u>Caltrans Holiday/Special Day</u>	<u>Date observed</u>
Martin Luther King Jr. Day	3rd Monday in January
Cesar Chaves Day	March 31st

	No closures after 12:00 Noon
	No closures allowed
	Designated Holiday - No closures allowed
	Caltrans Holiday/Special Day - No closures allowed
	No closures until 08:00
	No closures until 20:00

**Replace Reserved in section 12-4.02C(3)(f) with:**

Closure restrictions for designated holidays and special days are shown in the following table:

<b>Lane Closure Restrictions For Designated Holidays And Special Days</b>											
Thu	Fri	Sat	Sun	Mon	Tues	Wed	Thu	Fri	Sat	Sun	Mon
x	H xx	xx	xx	xxx							
	SD xx										
x	xx	H xx	xx	xxx							
		SD xx									
	xx	xx	H xx	xx	xxx						
			SD xx								
x	xx	xx	xx	H xx	xxx						
				SD xx	xxx						
				xx	H xx	xxx					
					SD xx						
					xx	H xx	xxx				
						SD xx					
						x	H xx	xxx			
					x	xx	H* xx	xx	xx	xx	xxx
							SD xx				

**Legend:**




	Refer to lane requirement charts.
x	The full width of the traveled way must be open for use by traffic after <u>1200</u> .
xx	The full width of the traveled way must be open for use by traffic.
xxx	The full width of the traveled way must be open for use by traffic until <u>0800</u> .
H	Designated holiday
H*	<u>Thanksgiving Holiday-The full width of the traveled way must be open for use by traffic between Tuesday at 1200 until the following Monday at 0800.</u>
SD	Special day

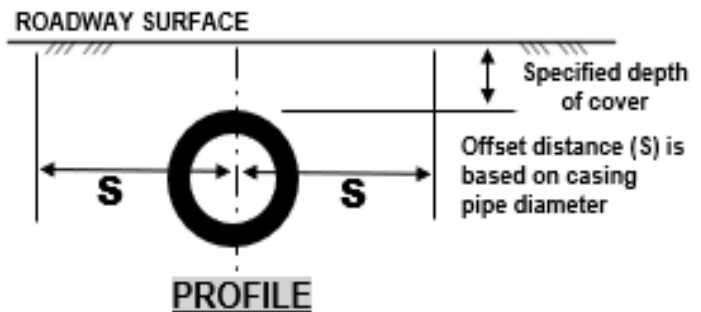


# SURVEY GRID

TR-0151 (Rev 07/2023)

**LEGEND:**

-  Octagon Data Points required when the casing pipe diameter is < 96 inches
-  Octagon & Triangle Data Points required when the casing pipe diameter is 96 inches or greater
-  Settlement rod may be required when the casing diameter is > 60 inches (See TR-0152 in Appendix E for settlement rod detail)



**EP** Edge of Pavement

**ETW** Edge of Travel Way  
(Fog line, Yellow Stripe, etc.)

- S** Offset distance away from the pipe alignment must be a minimum of:
- 3' for casing outer diameters < 30"
  - 5' for casing outer diameters < 72", but ≥ 30"
  - 10' for casing outer diameters < 108", but ≥ 72"
  - 15' for casing outer diameters ≥ 108"

For longitudinal installations, survey the EP and ETW:

- every 50' if they fall within "S" for installation greater than 500' in length.
- every 20' if they fall within "S" for installation less than or equal to 500' in length.
- at locations of angle points or sharp turns.

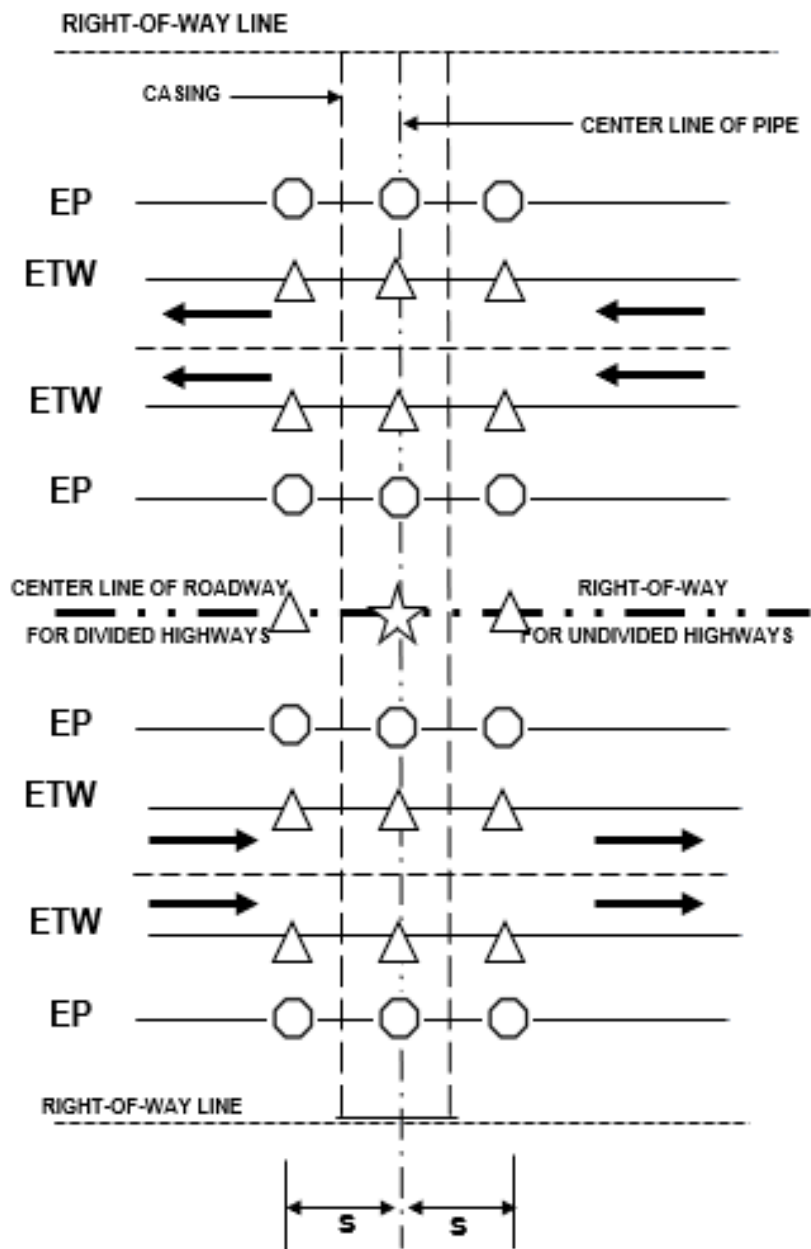
If any deformations or settlements are observed, Caltrans at its discretion may require surveys at shorter intervals as deemed necessary.

Survey improvements such as concrete pads, overhead signs, traffic loops, electrical boxes/vaults, and other man-made improvements within S + 3'.

**NOTES:**

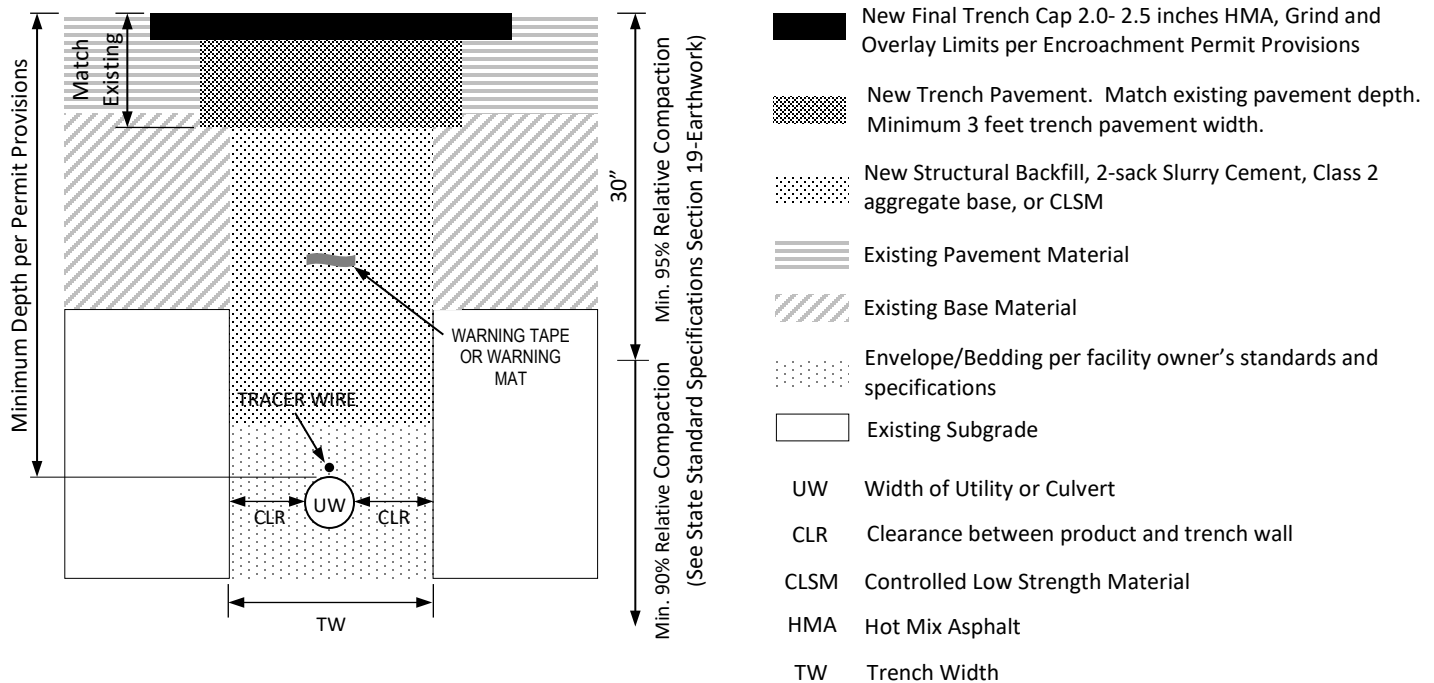
Survey data is to be collected at the specific points along the casing alignment at the following times:

1. Prior to Start of Work.
2. Every two (2) hours continuously throughout the project.
3. Upon completion of the project.
4. Every two (2) months, during a six-month period after the data of



**ENCROACHMENT PERMIT TRENCH DETAIL**

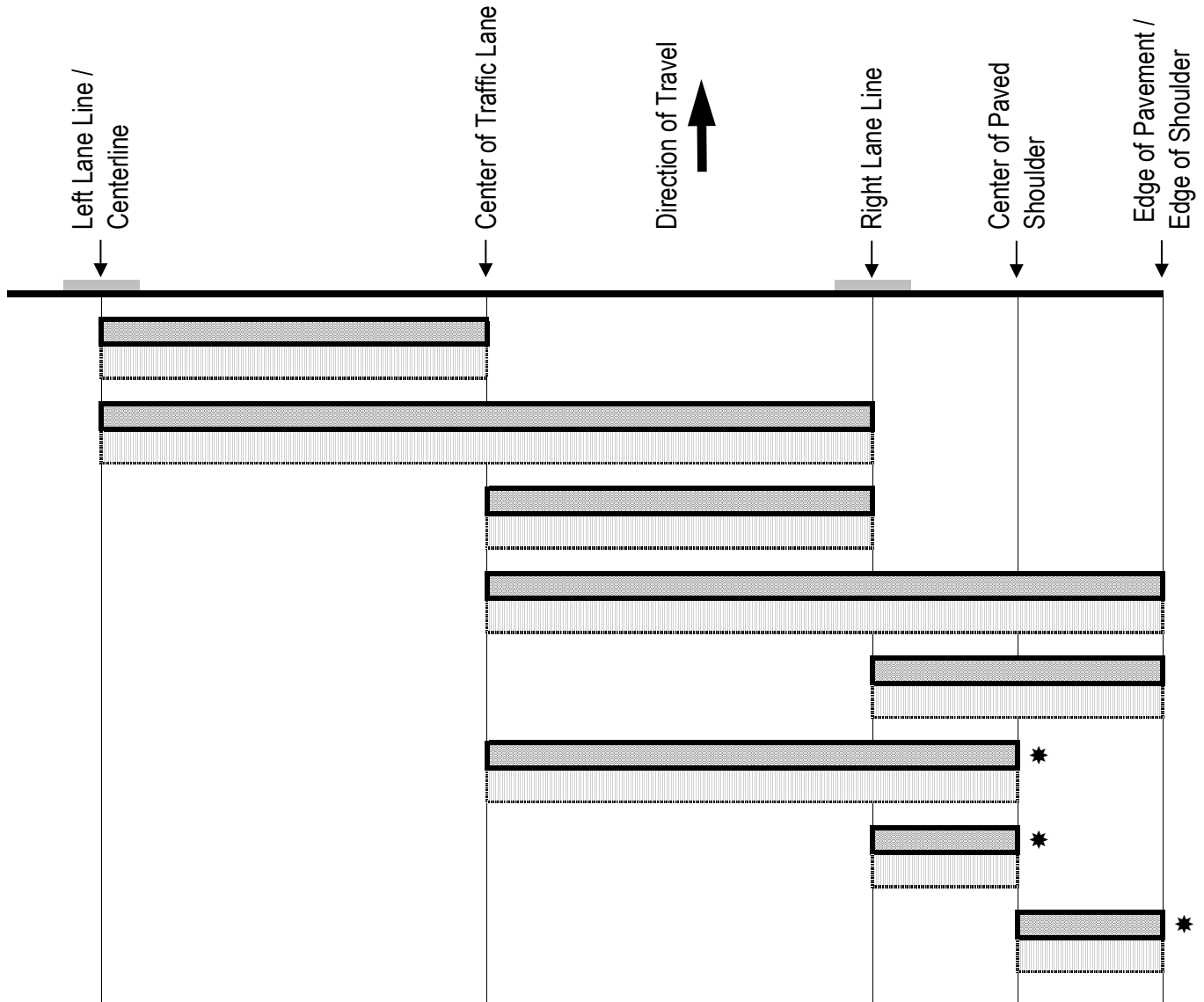
TR-0153 (REV. 07/2021) (REV. 04/2023 - District 5)

**TYPICAL TRENCH DETAIL**

1. Must include tracer wire or other continuous measure to provide positive subsurface detection for the life of the facility
2. Open trench installation of underground utility facilities must include warning tape or warning mats complying with the American Public Works Association (APWA) Uniform Color Code for identifying the type of underground utility. Where mechanical protection is installed, warning tape must be placed above the mechanical protection and below the roadbed subgrade as shown on the details. For all other backfills, warning tape or warning mat shall be placed half-way between the utility and the finished grade.
3. When the UW IS  $\geq 6"$  then the minimum CLR shall be 6"
4. New structural backfill shall consist of either 2-sack slurry cement, Class 2 aggregate base, or CLSM. When TW IS  $< 24$  inches, Class 2 aggregate base is not recommended for backfill
5. Structure backfill shall conform to Section 19-3.02C and 3.03 of the Standard Specifications
6. Slurry cement backfill shall conform to Section 19-3.02E of the State Standard Specifications
7. Aggregate base and its compaction shall conform to Section 26 of the State Standard Specifications
8. CLSM if used must conform to Section 19-3.02G of the Standard Specifications. When CLSM is utilized the mix design and test results must be submitted to the State's representative. See Appendix H of the Encroachment Permits Manual for additional information.
9. Hot Mix Asphalt (HMA) is used to backfill Asphalt Concrete (AC) Section of the road, HMA must conform to Section 39-2 of the State Standard Specifications
10. AC used to replace pavement section shall match existing pavement depth, unless directed otherwise by the State's representative.
11. A tack coat of asphaltic emulsion conforming to Section 29-2.01C (3) (f) shall be provided and applied
12. When the trench is within 4 feet of curb and gutter, additional cold planing may be required at the discretion of the State's representative. Potholes or trenches separated / adjoined by 10 feet or less to be overlaid together at the discretion of the State's representative.
13. Pavement markings and/or striping removed or damaged during construction must be replaced in kind as directed by the State's representative.
14. If trench is in Portland Cement Concrete (PCC) roadway, remove the concrete to a depth of at least 3 feet below finished grade as per standard Specification 15-1.03B. Replace entire concrete slab from joint to joint as directed by State's representative.
15. Electrical systems installations that are part of State Highway System must be installed in compliance with Caltrans Standard Specifications, Section 87.
16. All methods of compaction shall be by mechanical means. Ponding, jetting, or flooding shall not be allowed. Compaction shall conform to Section 19-5 of the State Standard Specifications
17. Cold planing to accommodate the placement of steel plates is required for posted speed limits 45 MPH or greater. State representative may request cold planing for steel plates to meet field conditions even if the posted speed is less than 45 MPH



# Limits of Grind and Overlay for Pavement Replacement

To determine the required grind and overlay width to cap your trench, find the location that best fits your trench and includes the limits of your trench repair. Please consult with the Caltrans Permit Inspector for additional guidance.



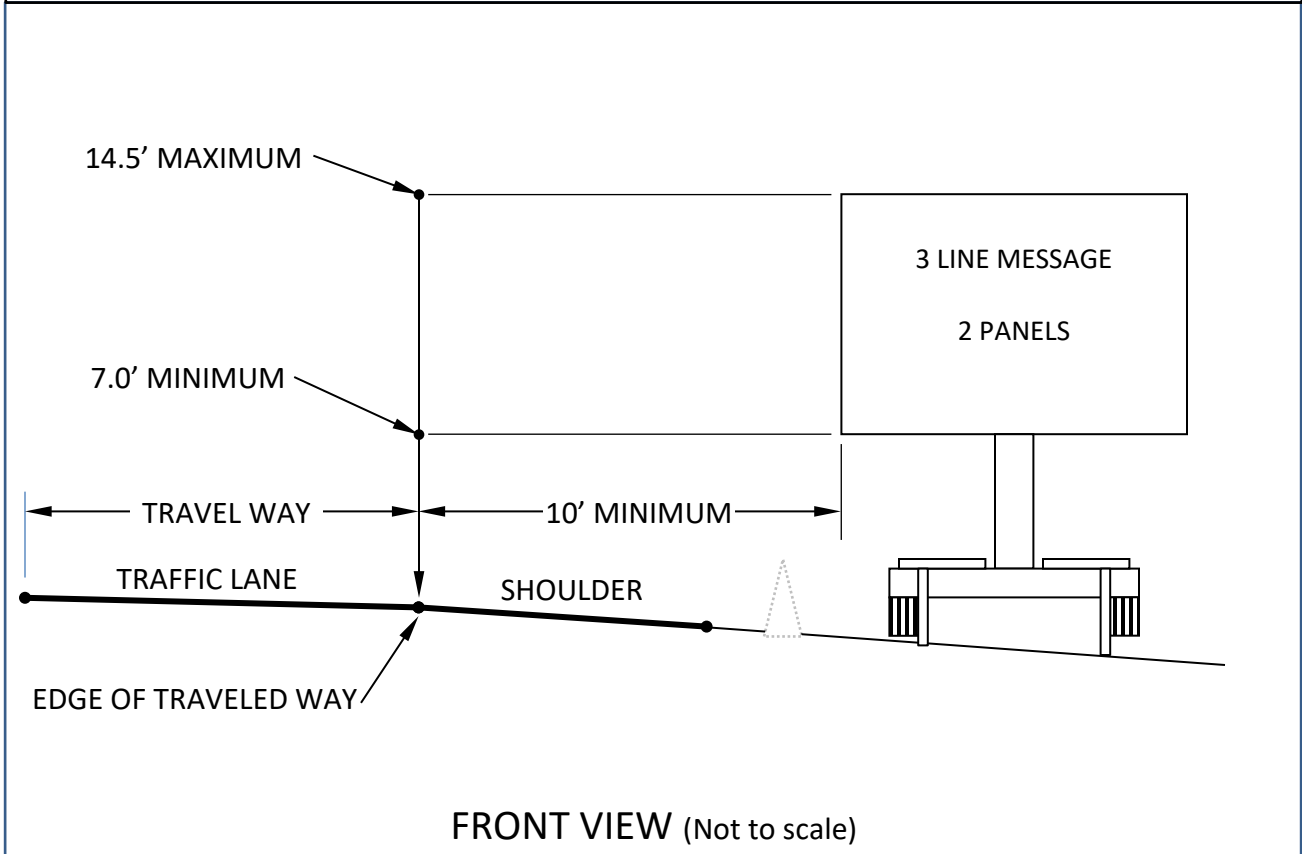
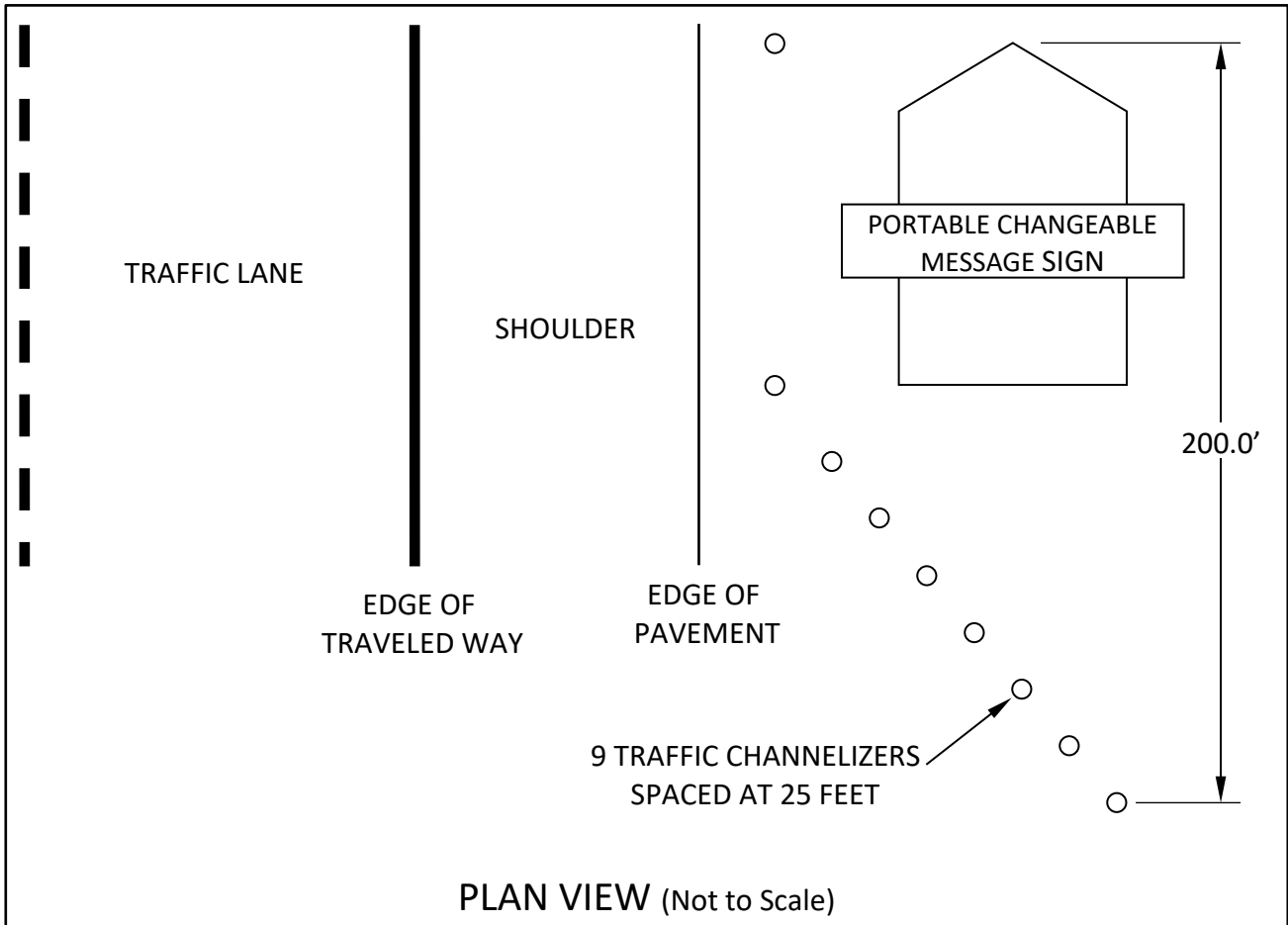
Example 1: A trench with limits shown hatched above, would require a grind and overlay of the entire traffic lane width.

Example 2: A trench with limits shown hatched above, would require a grind and overlay from the center of traffic lane to the right edge of traveled way.

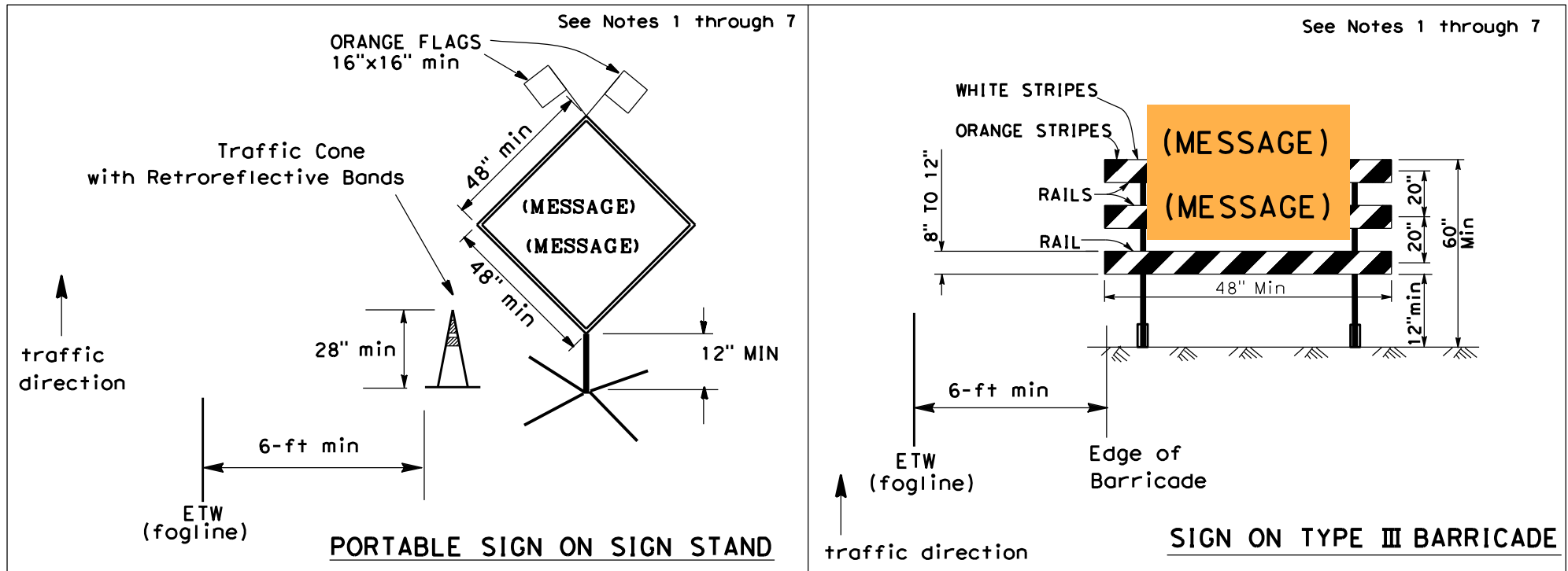
	Required Width for Grind and Overlay
	Limits of Trench Repair
*	For Paved Shoulder Widths 8' or greater only

Pavement repair in open graded pavement surfaces will require in kind replacement of surface layer.

# TYPICAL PORTABLE CHANGEABLE MESSAGE SIGN PLACEMENT



# TYPICAL TEMPORARY SIGN SUPPORTS DETAILS



## NOTES

(REV. 3/18/2016)

1. Maintain a 4-foot minimum clearance on sidewalks at all times and a minimum 5-foot clearance adjacent to a drop off, such as a curb face or gutter.
2. Signs shall not interfere with the visibility of other existing signs.
3. Sign supports must be NCHRP Report 350 eligible or MASH (Manual for Assessing Safety Hardware) crashworthy. Information on NCHRP Report 350 eligible devices can be found at: [http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road\\_hardware/wzd/workzone\\_pdmnu.cfm](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/wzd/workzone_pdmnu.cfm) Information on MASH can be found at: [http://safety.fhwa.dot.gov/roadway\\_dept/policy\\_guide/road\\_hardware/ctrmeasures/mash/](http://safety.fhwa.dot.gov/roadway_dept/policy_guide/road_hardware/ctrmeasures/mash/)
4. Sign message, color, shape, and size must conform to the current Caltrans Standards Specifications and current CA MUTCD (California Manual on Uniform Traffic Control Devices). (i.e. Rectangular or diamond shape) Information on Caltrans Sign Specifications can be found at: <http://www.dot.ca.gov/hq/traffops/engineering/control-devices/specs.htm>
5. Signs mounted on Type III barricades shall not cover the bottom rail.
6. Sign stands should be weighted down per the stand manufacturer's recommendations. (i.e. sand/gravel bags)
7. Signs to be placed for more than 3 consecutive days, shall be post mounted per Caltrans Standard Plans RS1 through RS4.



Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS
 REGISTERED CIVIL ENGINEER				
May 1, 2023 PLANS APPROVAL DATE				
				
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.				

TABLE 1

SPEED (S)	MINIMUM TAPER LENGTH * FOR WIDTH OF OFFSET 12 FEET (W)				MAXIMUM CHANNELIZING DEVICE SPACING		
	TANGENT 2L	MERGING L	SHIFTING L/2	SHOULDER L/3	X	Y	Z **
					TAPER	TANGENT	CONFLICT
mph	ft	ft	ft	ft	ft	ft	ft
20	160	80	40	27	20	40	10
25	250	125	63	42	25	50	12
30	360	180	90	60	30	60	15
35	490	245	123	82	35	70	17
40	640	320	160	107	40	80	20
45	1080	540	270	180	45	90	22
50	1200	600	300	200	50	100	25
55	1320	660	330	220	50	100	25
60	1440	720	360	240	50	100	25
65	1560	780	390	260	50	100	25
70	1680	840	420	280	50	100	25
75	1800	900	450	300	50	100	25

\* - For other offsets, use the following merging taper length formula for L:  
 For speed of 40 mph or less,  $L = WS^2/60$   
 For speed of 45 mph or more,  $L = WS$

Where: L = Taper length in feet  
 W = Width of offset in feet

S = Posted speed limit, off-peak 85th-percentile  
 speed prior to work starting, or the anticipated  
 operating speed in mph

\*\* - Use for taper and tangent sections where there are no pavement markings or where  
 there is a conflict between existing pavement markings and channelizers (CA).

TABLE 2

SPEED *	Min D **	DOWNGRADE Min D ***		
		-3%	-6%	-9%
		ft	ft	ft
mph	ft	ft	ft	ft
20	115	116	120	126
25	155	158	165	173
30	200	205	215	227
35	250	257	271	287
40	305	315	333	354
45	360	378	400	427
50	425	446	474	507
55	495	520	553	593
60	570	598	638	686
65	645	682	728	785
70	730	771	825	891
75	820	866	927	1003

\* - Speed is posted speed limit, off-peak 85th-percentile  
 speed prior to work starting, or the anticipated  
 operating speed in mph

\*\* - Longitudinal buffer space or flagger station spacing

\*\*\* - Use on sustained downgrade steeper than -3 percent  
 and longer than 1 mile.

TABLE 3

ROAD TYPE	DISTANCE BETWEEN SIGNS *		
	A	B	C
	ft	ft	ft
URBAN - 25 mph OR LESS	100	100	100
URBAN - MORE THAN 25 mph TO 40 mph	250	250	250
URBAN - MORE THAN 40 mph	350	350	350
RURAL	500	500	500
EXPRESSWAY / FREEWAY	1000	1500	2640

\* - The distances are approximate, are intended for guidance  
 purposes only, and should be applied with engineering judgment.  
 These distances should be adjusted by the Engineer for field  
 conditions, if necessary, by increasing or decreasing the  
 recommended distances.

**NOTES:**

See Standard Plan T9 for tables.

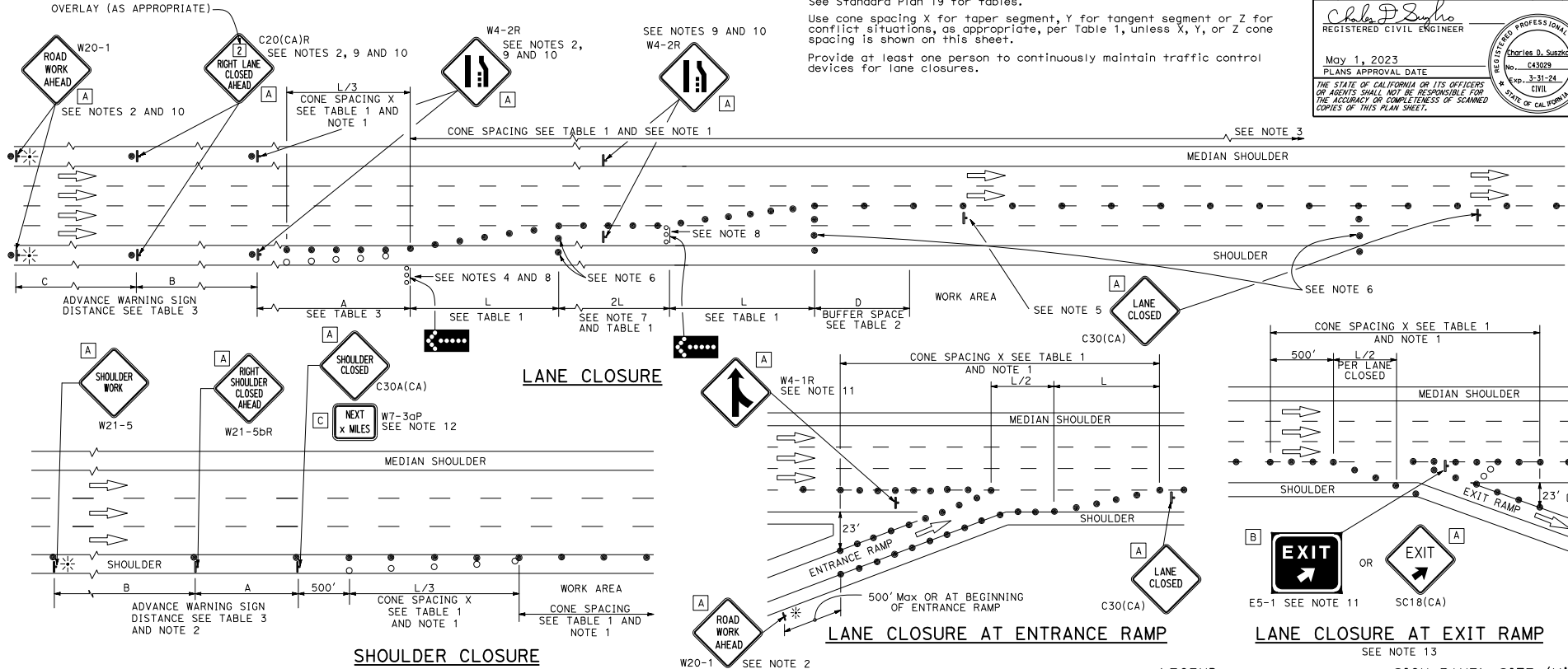
Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

Provide at least one person to continuously maintain traffic control devices for lane closures.

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Charles D. Suszko*  
 REGISTERED CIVIL ENGINEER  
 No. C43029  
 Exp. 3-31-24  
 CIVIL

May 1, 2023  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**NOTES:**

1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
3. A C20-2 "END ROAD WORK" sign, with minimum size of 48" x 24" as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
4. A minimum 1500' sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
5. Place a C30(CA) sign every 1000' throughout length of lane closure.
6. A minimum of 3 cones shall be placed transversely across each closed lane and shoulder at each location where a taper across a traffic lane ends and every 1000' as shown on the "Lane Closure" detail. Two type II barricades may be used instead of the 3 cones. The transverse alignment of the cones or barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.
7. The 2L tangent shown along lane lines shall be used between the L tapers required for each closed traffic lane.
8. Use one flashing arrow sign for each lane closed. The flashing arrow sign shall be Type I.
9. Median lane closures shall conform to the details as shown except that C20(CA)L and W4-2L signs shall be used.
10. Duplicate sign installations are not required:
  - a) On opposite shoulder if at least one-half of the available lanes remain open to traffic.
  - b) In the median if the width of the median shoulder is less than 8' and the outside lanes are to be closed.
11. The E5-1 or SC18(CA) and W4-1 signs shall be used as shown.
12. A W7-3aP "NEXT MILES" plaque must be used if the shoulder closure extends beyond the distance that can be perceived by road users.
13. For the warning sign requirements at the Exit Ramp, when work is proposed on the local street, see CA MUTCD Figure 6H-22 to 6H-27.

**LEGEND**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- ⬇️ TEMPORARY TRAFFIC CONTROL SIGN
- ⚡ FLASHING ARROW SIGN (FAS)
- 🚚 FAS SUPPORT OR TRAILER
- ⚡ PORTABLE FLASHING BEACON

**SIGN PANEL SIZE (Min)**

- [A] 48" x 48"
- [B] 72" x 60"
- [C] 36" x 30"

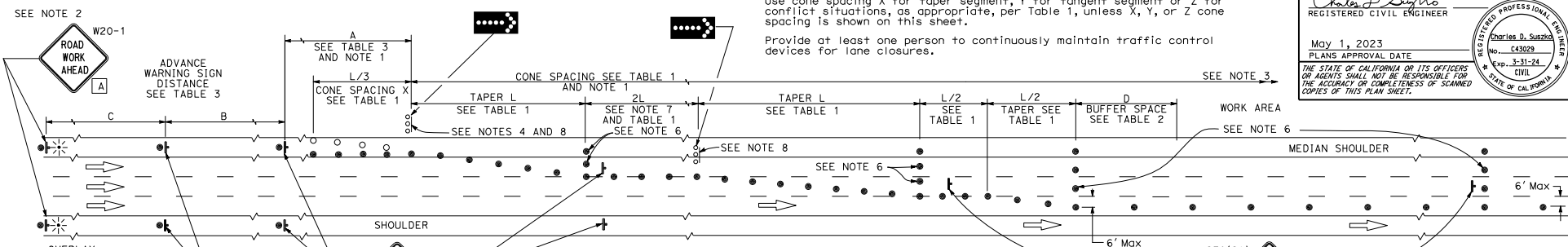
STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR LANE CLOSURE ON  
 FREEWAYS AND EXPRESSWAYS**  
 NO SCALE

**T10**

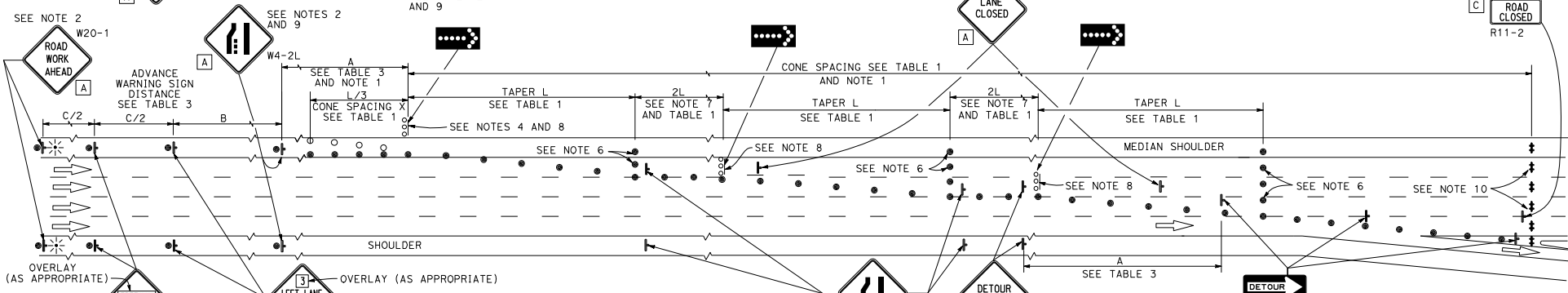
NOTES:

See Standard Plan T9 for tables. Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet. Provide at least one person to continuously maintain traffic control devices for lane closures.

Approval stamp for Charles D. Suszko, Registered Civil Engineer, dated May 1, 2023. Includes project details and a disclaimer: 'THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.'



LANE CLOSURE WITH PARTIAL SHOULDER USE



COMPLETE CLOSURE

NOTES:

- 1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
3. A G20-2 "END ROAD WORK" sign, with minimum size of 48" x 24" as appropriate, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within a larger project's limits.
4. A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
5. Place a C30(CA) sign every 1000' throughout length of lane closure.
6. A minimum of 3 cones shall be placed transversely across each closed lane and shoulder at each location where a taper across a traffic lane ends and every 1000' as shown on the "Lane Closure with Partial Shoulder Use" detail. Two type II barricades may be used instead of the 3 cones. The transverse alignment of the cones or barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.
7. The 2L tangent shown along lane lines shall be used between the L tapers required for each closed traffic lane.
8. Use one flashing arrow sign for each lane closed. The flashing arrow sign shall be Type I.
9. Lane closures on the right side using partial median shoulder as a traffic lane shall conform to the details shown except that C20(CA)R and W4-2R signs shall be used.
10. A minimum of Two Type II or III barricades shall be placed across each Type II or III closed lane and shoulder at the location shown and every 2000' within the complete closure area. Within the complete closure area, the transverse alignment of the barricades on the closed shoulder may be shifted from the transverse alignment to provide access to the work.

SIGN PANEL SIZE (Min)

- A 48" x 48"
B 48" x 18"
C 48" x 30"

LEGEND

- TRAFFIC CONE
○ TRAFFIC CONE (OPTIONAL TAPER)
T TEMPORARY TRAFFIC CONTROL SIGN
[Flashing Arrow] FLASHING ARROW SIGN (FAS)
[Support] FAS SUPPORT OR TRAILER
[Beacon] PORTABLE FLASHING BEACON

STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE ON FREEWAYS AND EXPRESSWAYS NO SCALE

T10A



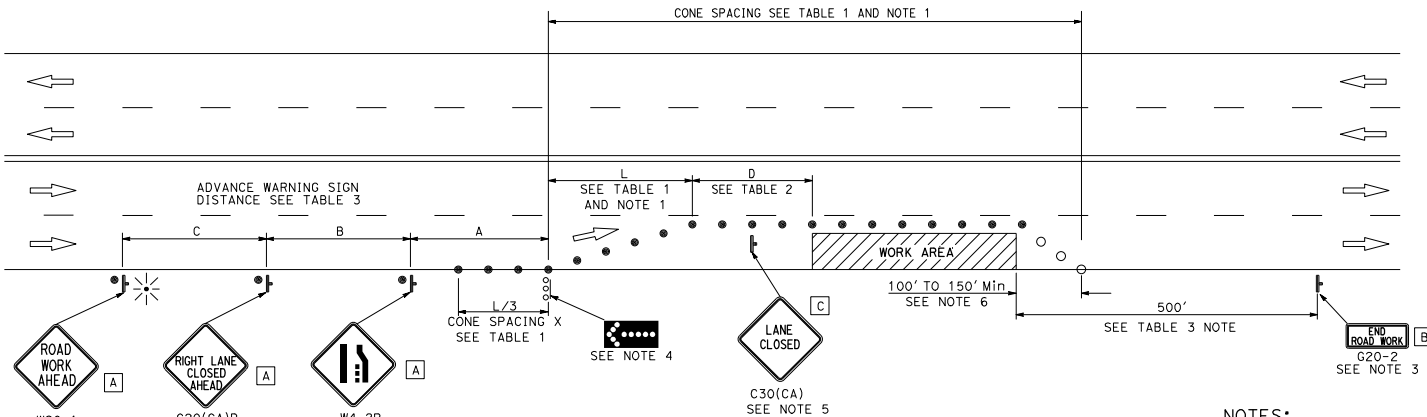
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

*Charles D. Suszko*  
 REGISTERED CIVIL ENGINEER

May 1, 2023  
 PLANS APPROVAL DATE

Charles D. Suszko  
 No. C43029  
 Exp. 3-31-24  
 CIVIL  
 STATE OF CALIFORNIA

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**TYPICAL LANE CLOSURE**

**NOTES:**

- See Standard Plan T9 for tables.
- Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.
- Provide at least one person to continuously maintain traffic control devices for lane closures.

**NOTES:**

- Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
- Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
- A G20-2 "END ROAD WORK" sign shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
- A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
- Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work area.
- Length may be reduced by the Engineer to address site conditions.
- Median lane closures shall conform to the details shown except that C20(CA)L and W4-2L signs shall be used.
- For approach speeds over 50 MPH, use the "Traffic Control System for Lane Closure on Freeways and Expressways" plan for lane closure details and requirements.

**LEGEND**

- TRAFFIC CONE
- TRAFFIC CONE (OPTIONAL TAPER)
- † TEMPORARY TRAFFIC CONTROL SIGN
- FLASHING ARROW SIGN (FAS)
- ▬ FAS SUPPORT OR TRAILER
- ☼ PORTABLE FLASHING BEACON

**SIGN PANEL SIZE (Min)**

- A 48" x 48"
- B 36" x 18"
- C 30" x 30"

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR LANE CLOSURE ON  
 MULTILANE CONVENTIONAL HIGHWAYS**  
 NO SCALE

**T11**

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL SHEETS

*Charles D. Suzco*  
 REGISTERED CIVIL ENGINEER  
 No. C43029  
 Exp. 3-31-24  
 CIVIL  
 STATE OF CALIFORNIA

May 1, 2023  
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**LEGEND**

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⬇️ FLASHING ARROW SIGN (FAS)
- ☀️ FAS SUPPORT OR TRAILER
- ☀️ PORTABLE FLASHING BEACON

**SIGN PANEL SIZE (Min)**

- A 48" x 48"
- B 24" x 24"
- C 36" x 18"

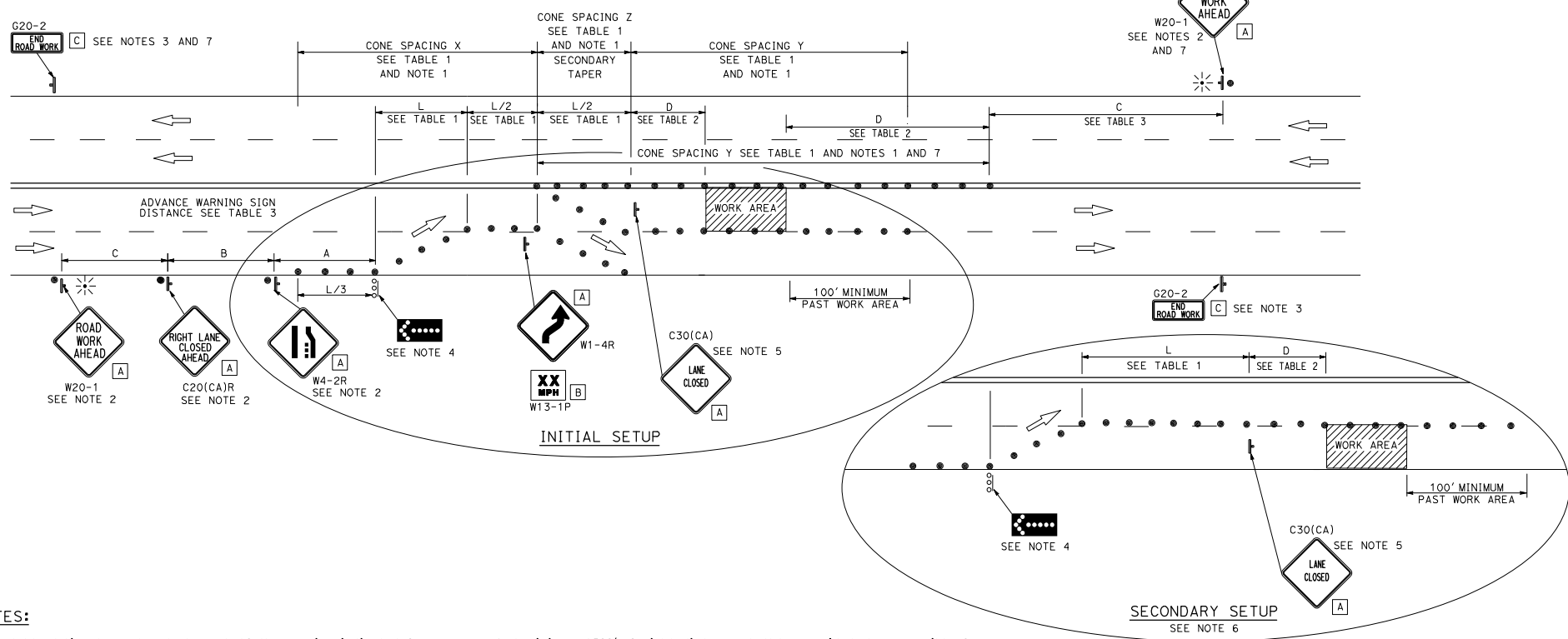
**NOTES:**

See Standard Plan T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

Provide at least one person to continuously maintain traffic control devices for lane closures.

**TYPICAL CHANGEABLE LANE CLOSURE**



**NOTES:**

- Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
- Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacon shall be placed at the locations indicated for lane closure during hours of darkness.
- A G20-2 "END ROAD WORK" sign shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
- A minimum 1500' of sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest vertical curve or on a horizontal curve.
- Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work area.
- Relocate secondary taper to tangent location and relocate C30(CA) sign. Remove W1-4R/W13-1P sign package.
- Sign installations and cones are not required when a median barrier is in place.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM  
 FOR CHANGEABLE LANE CLOSURE  
 ON MULTILANE CONVENTIONAL  
 HIGHWAYS AND EXPRESSWAYS**

NO SCALE

**T11A**

**LEGEND**

- TRAFFIC CONE
- ⊢ TEMPORARY TRAFFIC CONTROL SIGN
- ⬢⬢⬢⬢ FLASHING ARROW SIGN (FAS)
- ☀ FAS SUPPORT OR TRAILER
- ☀ PORTABLE FLASHING BEACON

**SIGN PANEL SIZE (Min)**

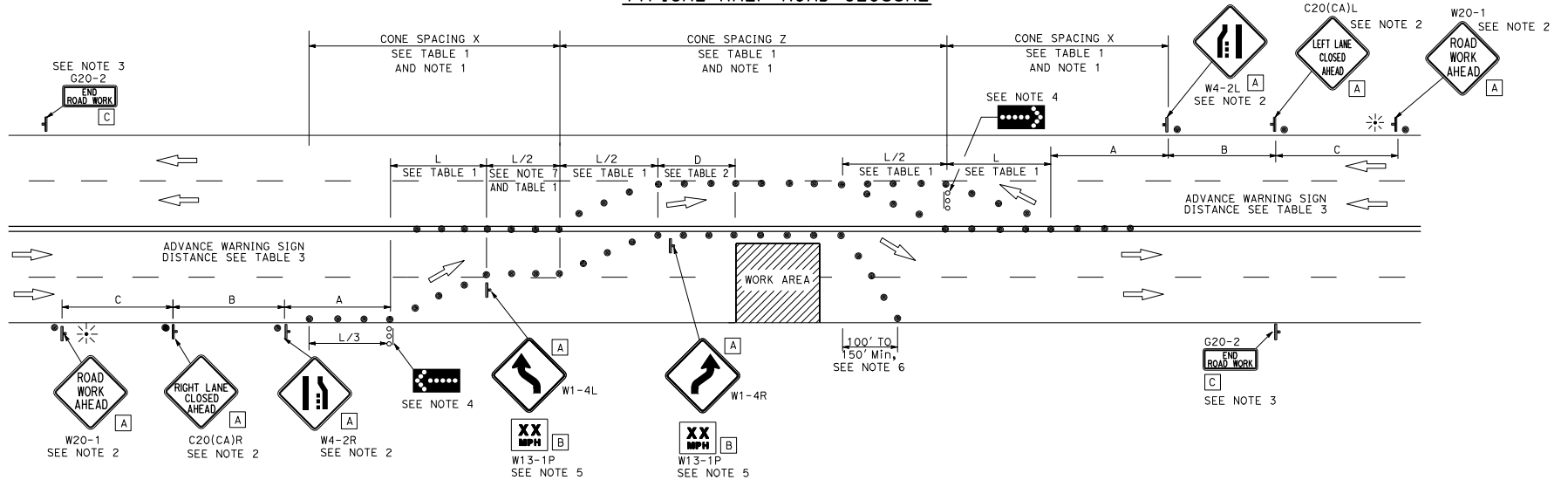
- A 48" x 48"
- B 24" x 24"
- C 36" x 18"

**NOTES:**

See Standard Plan T9 for tables.  
 Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.  
 Provide at least one person to continuously maintain traffic control devices for lane closures.

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
REGISTERED CIVIL ENGINEER					
May 1, 2023 PLANS APPROVAL DATE					
THE STATE OF CALIFORNIA OR ITS OFFICERS OF AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.					

**TYPICAL HALF ROAD CLOSURE**



**NOTES:**

1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Each advance warning sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. Flashing beacons shall be placed at the locations indicated for lane closure during hours of darkness.
3. A C20-2 "END ROAD WORK" sign, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
4. A minimum 1500' sight distance shall be provided where possible for vehicles approaching the first flashing arrow sign. Lane closures shall not begin at the top of crest verticle curve or on a horizontal curve.
5. Advisory speed will be determined by the Engineer. The W13-1P Plaque will not be required when advisory speed is more than the posted or maximum speed limit.
6. Length may be reduced by the Engineer to address site conditions.
7. The tangent (L/2) shall be used.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR HALF ROAD CLOSURE  
 ON MULTILANE CONVENTIONAL  
 HIGHWAYS AND EXPRESSWAYS**

NO SCALE

**T12**

**NOTES:**

See Standard Plan T9 for tables.

Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1, unless X, Y, or Z cone spacing is shown on this sheet.

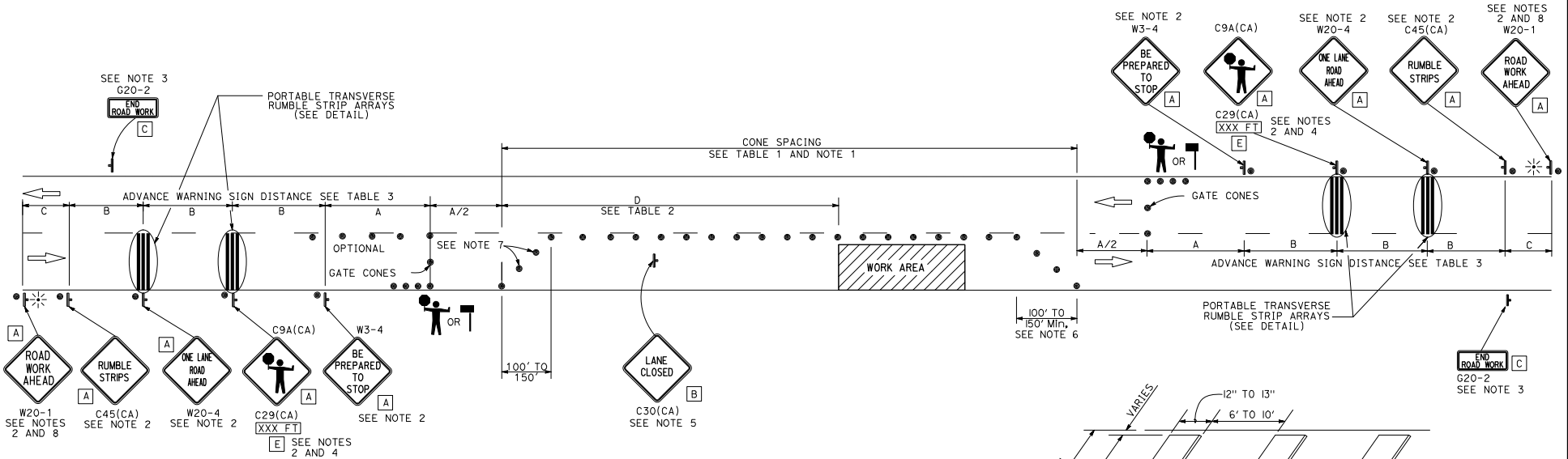
Provide at least one person to continuously maintain traffic control devices for lane closures.

**SIGN PANEL SIZE (Min)**

- A 48" x 48"
- B 30" x 30"
- C 36" x 18"
- D 36" x 42"
- E 20" x 7"

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

May 1, 2023  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

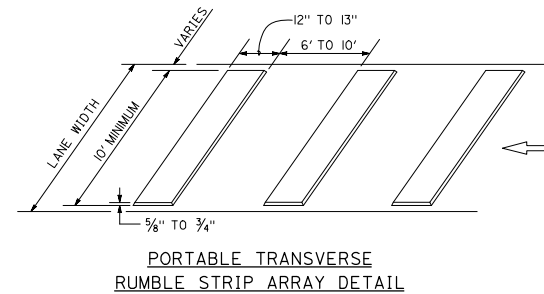


**NOTES:**

- Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
- Sign must be equipped with at least two flags for daytime closures. Flags must be orange in color and at least 16 inches by 16 inches in size. Place flashing beacons as shown for closures during hours of darkness.
- A G20-2 "END ROAD WORK" sign, shall be placed at the end of the lane closure unless the end of work area is obvious or ends within the larger project's limits.
- An optional C29(CA) sign may be placed below the C9A(CA) sign.
- Place C30(CA) "LANE CLOSED" sign at 500' to 1000' intervals throughout extended work area. They are optional if the work area is visible from the flagger station.
- Length may be reduced by the Engineer to address site conditions.
- Either traffic cones or barricades shall be placed on the taper. Barricades shall be Type I, II, or III.
- If C45(CA) is not used, measure distance C from W20-4.

**LEGEND**

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ☼ PORTABLE FLASHING BEACON
- FLAGGER
- AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD)



STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
WITH REVERSIBLE CONTROL ON  
TWO LANE CONVENTIONAL HIGHWAYS**

NO SCALE

LEGEND:

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⊛ PORTABLE FLASHING BEACON
- 🚚 TRAILER
- 👤 FLAGGER
- PCMS PORTABLE CHANGEABLE MESSAGE SIGN

SIGN PANEL SIZE (Min):

A 48" x 48"

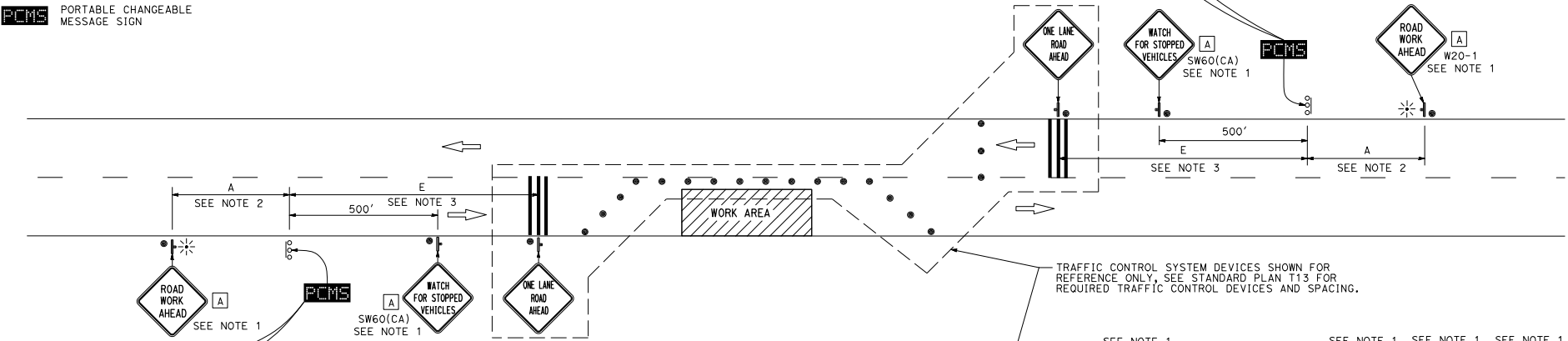
DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

REGISTERED CIVIL ENGINEER  
 Charles D. Suszko  
 No. C43029  
 Exp. 3-31-24  
 CIVIL  
 STATE OF CALIFORNIA

May 1, 2023  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

**FLAGGER AHEAD**

**PREPARE TO STOP**

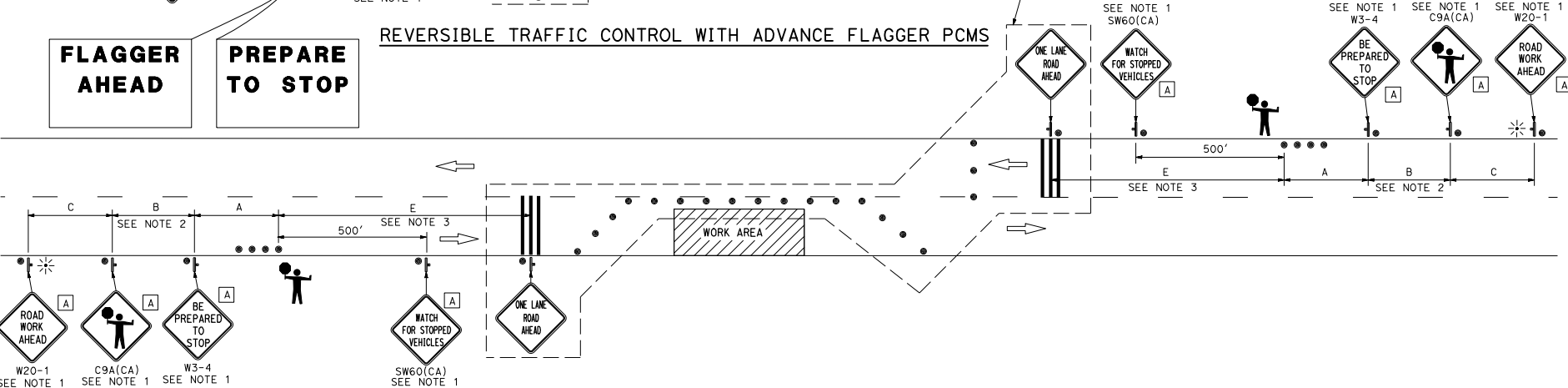


TRAFFIC CONTROL SYSTEM DEVICES SHOWN FOR REFERENCE ONLY. SEE STANDARD PLAN T13 FOR REQUIRED TRAFFIC CONTROL DEVICES AND SPACING.

**FLAGGER AHEAD**

**PREPARE TO STOP**

REVERSIBLE TRAFFIC CONTROL WITH ADVANCE FLAGGER PCMS



REVERSIBLE TRAFFIC CONTROL WITH ADVANCE FLAGGERS

NOTES:

1. Sign must be equipped with at least two flags for daytime closures. Flags must be orange in color and at least 16 inches by 16 inches in size. Place flashing beacons as shown for closures during hours of darkness.
2. See Standard Plan T9, Table 3 for advanced warning sign spacing.
3. See Standard Specification 12-4.02C.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION

**TRAFFIC CONTROL SYSTEM**  
**TWO LANE CONVENTIONAL HIGHWAYS**

NO SCALE

T13A

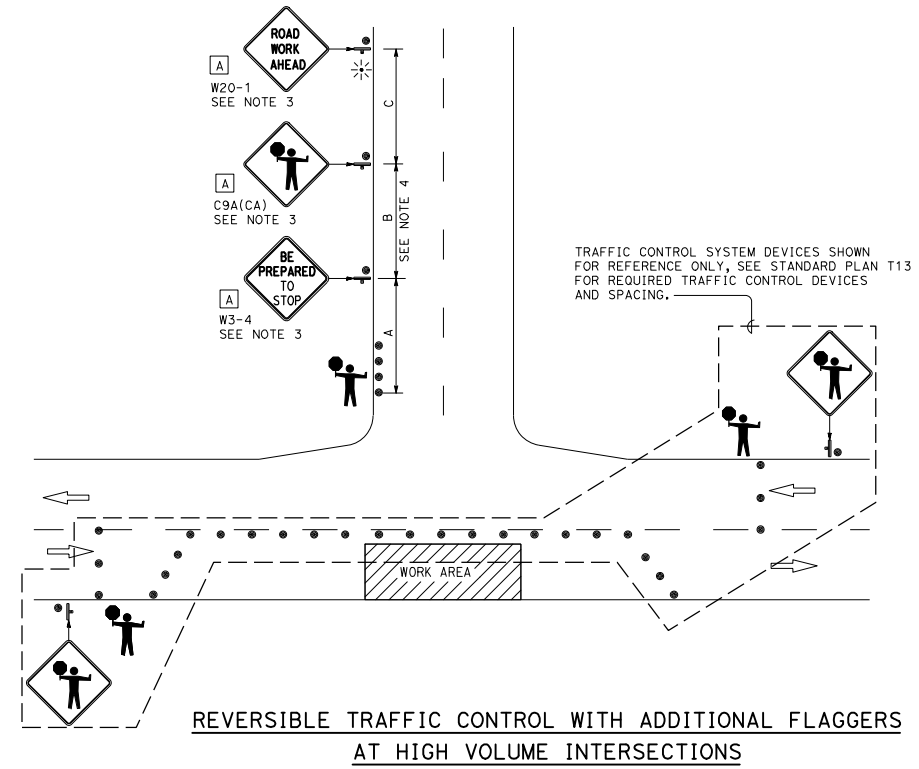
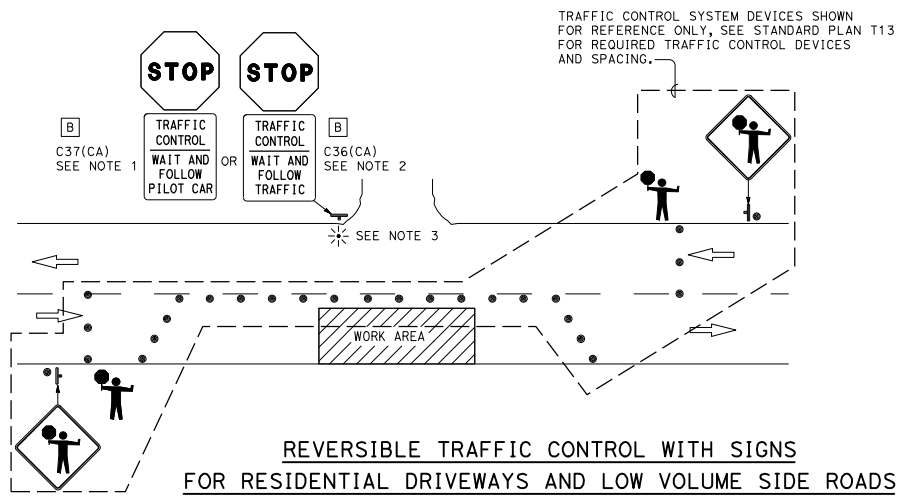
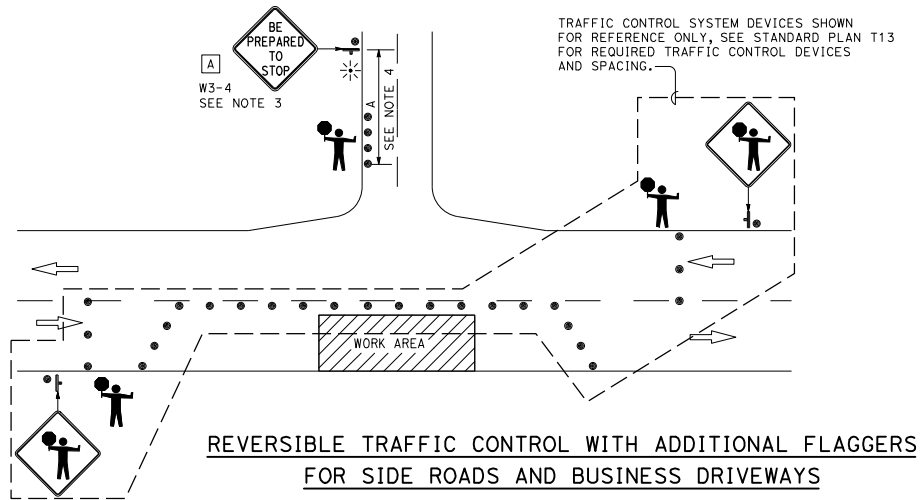
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

*Charles D. Suszko*  
 REGISTERED CIVIL ENGINEER

May 1, 2023  
 PLANS APPROVAL DATE

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

REGISTERED PROFESSIONAL ENGINEER  
 Charles D. Suszko  
 No. C43029  
 Exp. 3-31-24  
 CIVIL  
 STATE OF CALIFORNIA



**NOTES:**

- Place C37(CA) sign when pilot car is used.
- Place C36(CA) sign when pilot car is not used.
- Sign must be equipped with at least two flags for daytime closures. Flags must be orange in color and at least 16 inches by 16 inches in size. Place flashing beacons as shown for closures during hours of darkness.
- See Standard Plan T9, Table 3 for advance warning sign spacing.

**LEGEND:**

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⚡ PORTABLE FLASHING BEACON
- 👤 FLAGGER

**SIGN PANEL SIZE (Min)**

- A 48" x 48"
- B 36" x 42"

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM**  
**TWO LANE CONVENTIONAL HIGHWAYS**  
 NO SCALE

**T13B**

# TYPICAL RAMP CLOSURES

SIGN PANEL SIZE (Min)

- A 48" x 48"
- B 48" x 30"
- C 36" x 36"
- D 48" x 36"

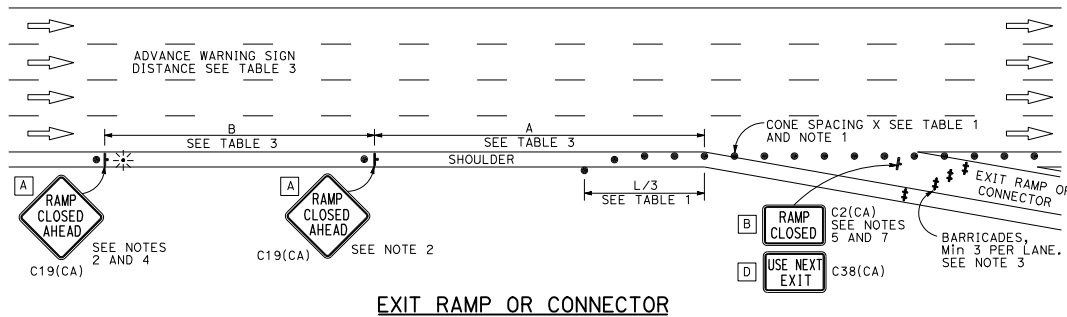
## LEGEND

- TRAFFIC CONE
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⚡ BARRICADES
- ⚡ PORTABLE FLASHING BEACON

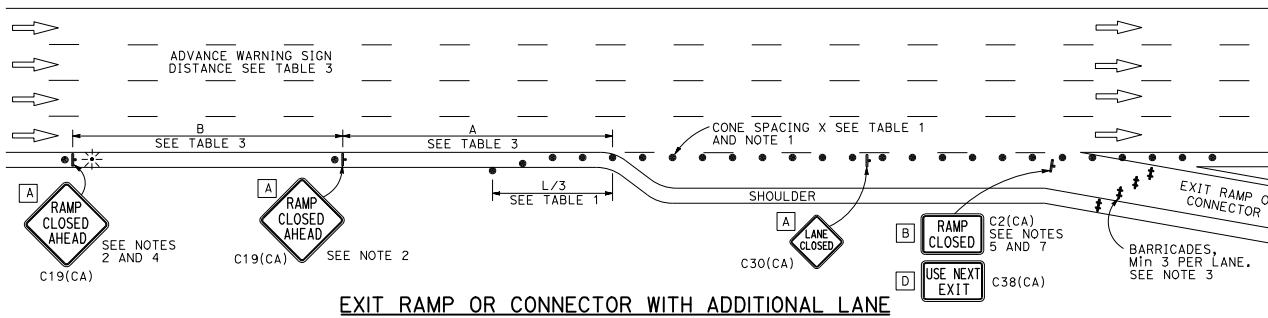
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Charles D. Suszko*  
 REGISTERED CIVIL ENGINEER  
 No. C43029  
 Exp. 3-31-24  
 CIVIL  
 STATE OF CALIFORNIA

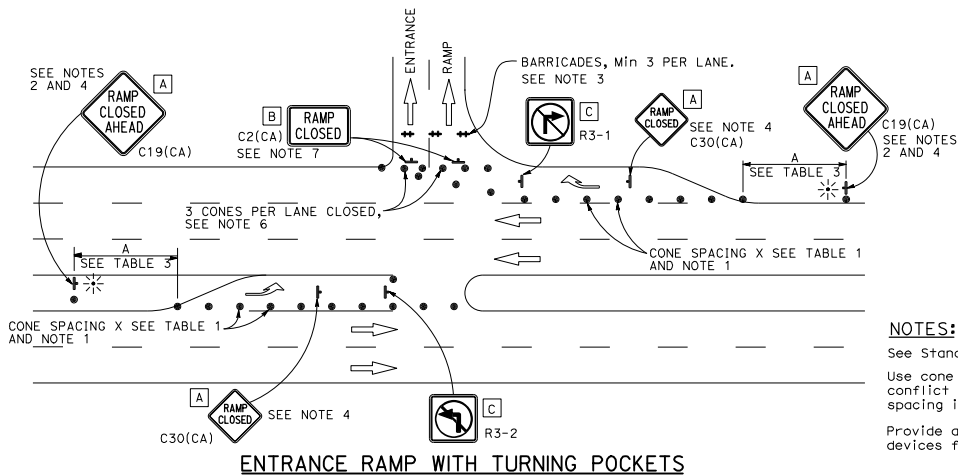
May 1, 2023  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



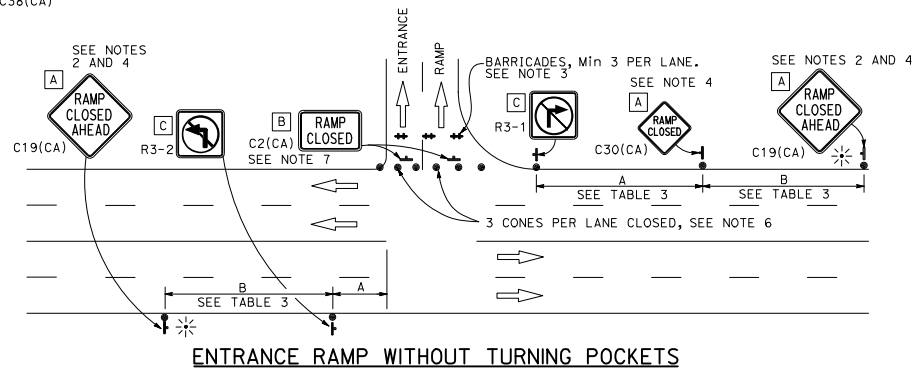
EXIT RAMP OR CONNECTOR



EXIT RAMP OR CONNECTOR WITH ADDITIONAL LANE



ENTRANCE RAMP WITH TURNING POCKETS



ENTRANCE RAMP WITHOUT TURNING POCKETS

## NOTES:

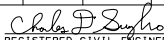
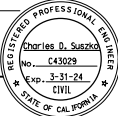
1. Portable delineators placed at one-half the spacing indicated for traffic cones may be used instead of cones for daytime closures only.
2. Each advance warning C19(CA) "RAMP CLOSED AHEAD" sign shall be equipped with at least two flags for daytime closure. Each flag shall be at least 16" x 16" in size and shall be orange or fluorescent red-orange in color. A flashing beacon shall be placed on top of the first C19(CA) sign during hours of darkness.
3. Barricades shall be Type I, II or III for closures lasting one week or less and Type III for closures lasting longer than one week.
4. In addition to placing the C19(CA) "RAMP CLOSED AHEAD" and C30(CA) "RAMP CLOSED" signs, black on orange overlay plates with the word "closed" may be mounted. As directed by the Engineer on all guide signs that refer to the closed ramp. The letter size on the overlay shall be the same as the guide sign.
5. The existing "EXIT" signs shall be covered during ramp closures.
6. A minimum of 3 cones shall be placed transversely across each closed lane and shoulder.
7. C2(CA) sign shall be black and white.

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TRAFFIC CONTROL SYSTEM  
 FOR RAMP CLOSURE**  
 NO SCALE

T14

2023 STANDARD PLAN T14

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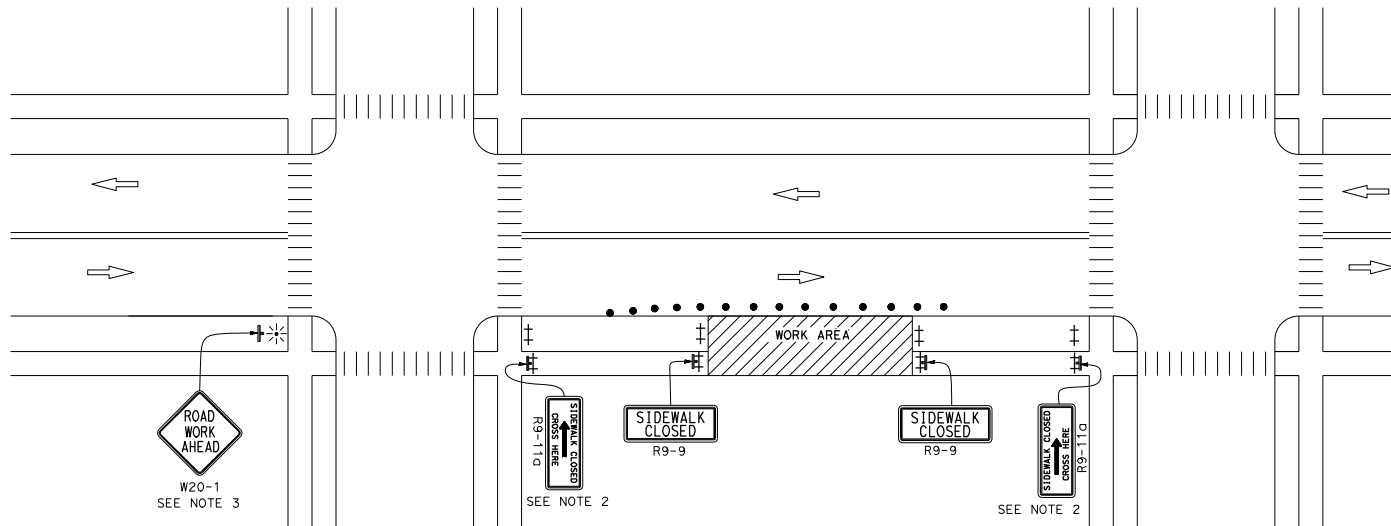
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
 REGISTERED CIVIL ENGINEER					
May 1, 2023 PLANS APPROVAL DATE					
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>					

**NOTES:**

1. Only signs related to pedestrians are shown. For all other signs see appropriate T-sheets.
2. Barricades closing sidewalk shall cover the full width of the sidewalk. Use R9-11 sign when there are destination points between the detour and the work area. Locate the R9-11 sign to allow pedestrian access.
3. Advance warning sign is not required if the work area is within the limits of a larger work zone. Sign shall be equipped with at least two flags for daytime closure. Each flag shall be orange or fluorescent red-orange in color.

**NOTES:**

See Standard Plan T9 for tables.  
 Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1 unless X,Y, or Z cone spacing is shown on this sheet.



**LEGEND:**

- ⊥ BARRICADE
- TRAFFIC CONE
- ⚡ PORTABLE FLASHING BEACON
- ⊥ SIGN
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN ON BARRICADE

**SIGN PANEL SIZE (Min)**

SIGN DESIGNATION	SIGN OR PLAQUE	SIGN SIZE
R9-9	SIDEWALK CLOSED	24" x 12"
R9-11	SIDEWALK CLOSED AHEAD CROSS HERE	24" x 18"
R9-11a	SIDEWALK CLOSED CROSS HERE	24" x 12"
W20-1	ROAD WORK AHEAD	36" x 36"

345

2023 STANDARD PLAN T30

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TEMPORARY PEDESTRIAN ACCESS ROUTES  
 TYPICAL SIDEWALK CLOSURE  
 AND PEDESTRIAN DETOUR**  
 NO SCALE

**T30**



**NOTES:**

1. Only signs related to pedestrians are shown. For all other signs see appropriate T-sheets.
2. Separate pedestrian walkway from traffic and work zone activities, when temporary walkway is adjacent to traffic.
3. The temporary pedestrian access route must not lead into conflict with vehicles or work.
4. Advance warning sign is not required if the work area is within the limits of a larger work zone. Sign shall be equipped with at least two flags for daytime closure. Each flag shall be orange or fluorescent red-orange in color.
5. All devices used to channelize pedestrian flow must connect such that gaps do not allow pedestrians to stray from the channelized path.
6. Barricades closing sidewalk shall cover the full width of the sidewalk.
7. Separate the temporary pedestrian access route from traffic using a temporary barrier and a crash cushion if necessary.
8. When it is not possible to maintain a minimum of 60 inches throughout the length of the pedestrian route, maintain a minimum width of 48 inches and provide a 60 X 60-inch passing space at least every 200 feet.
9. See Standard Plan A88A for detectable warning surface for curb ramps to apply to temporary curb ramps.
10. See Standard Plan T34 for temporary curb ramp options.

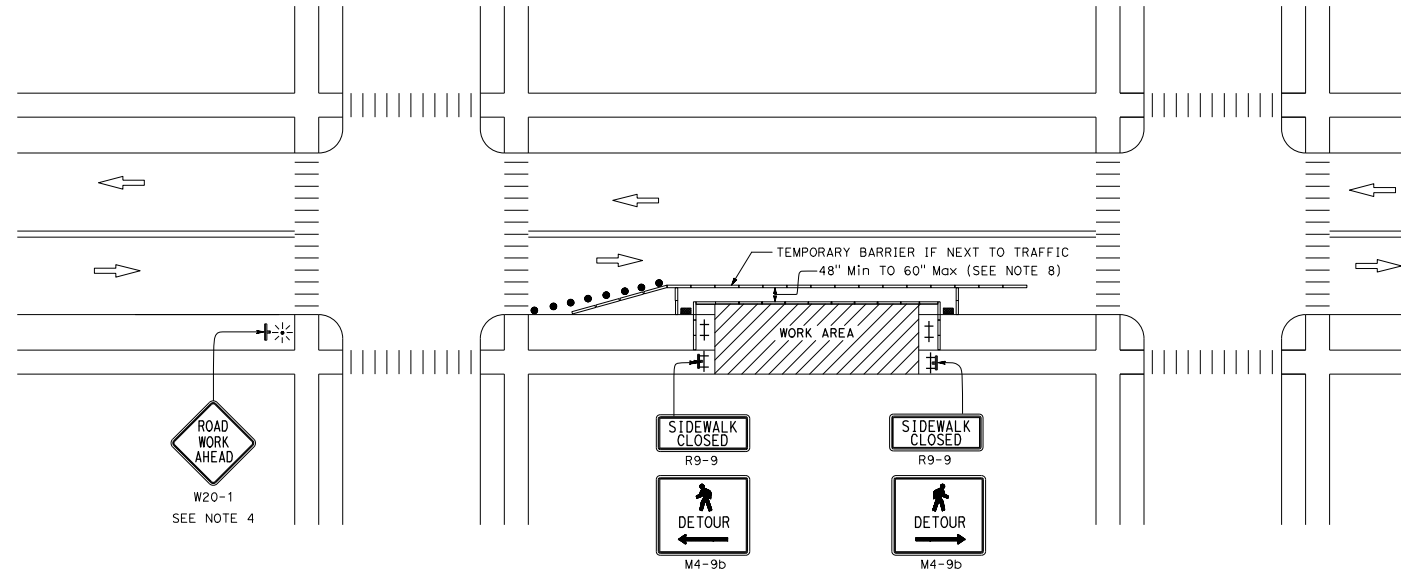
**NOTES:**

See Standard Plan T9 for tables.  
 Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1 unless X, Y, or Z cone spacing is shown on this sheet.

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS

*Charles D. Suszko*  
 REGISTERED CIVIL ENGINEER  
 No. C43029  
 Exp. 3-31-24  
 CIVIL  
 STATE OF CALIFORNIA

May 1, 2023  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**LEGEND:**

- ⊥ BARRICADE
- TEMPORARY CURB RAMP
- ▭ CHANNELIZING DEVICE
- TRAFFIC CONE
- ⊛ PORTABLE FLASHING BEACON
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN ON BARRICADE

**SIGN PANEL SIZE (Min)**

SIGN DESIGNATION	SIGN OR PLAQUE	SIGN SIZE
M4-9b	PEDESTRIAN DETOUR	30" x 24"
R9-9	SIDEWALK CLOSED	24" x 12"
W20-1	ROAD WORK AHEAD	36" x 36"

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TEMPORARY PEDESTRIAN ACCESS ROUTES  
 TYPICAL SIDEWALK DIVERSION  
 WITHIN ROADBED**

NO SCALE

**T31**

**NOTES:**

1. Only signs related to pedestrians are shown. For all other signs see appropriate T-sheets.
2. Barricades closing sidewalk shall cover the full width of the sidewalk. Use R9-11 sign when there are destination points between the detour and the work area. Locate the R9-11 sign to allow pedestrian access.
3. Advance warning sign is not required if the work area is within the limits of a larger work zone. Sign shall be equipped with at least two flags for daytime closure. Each flag shall be orange or fluorescent red-orange in color.

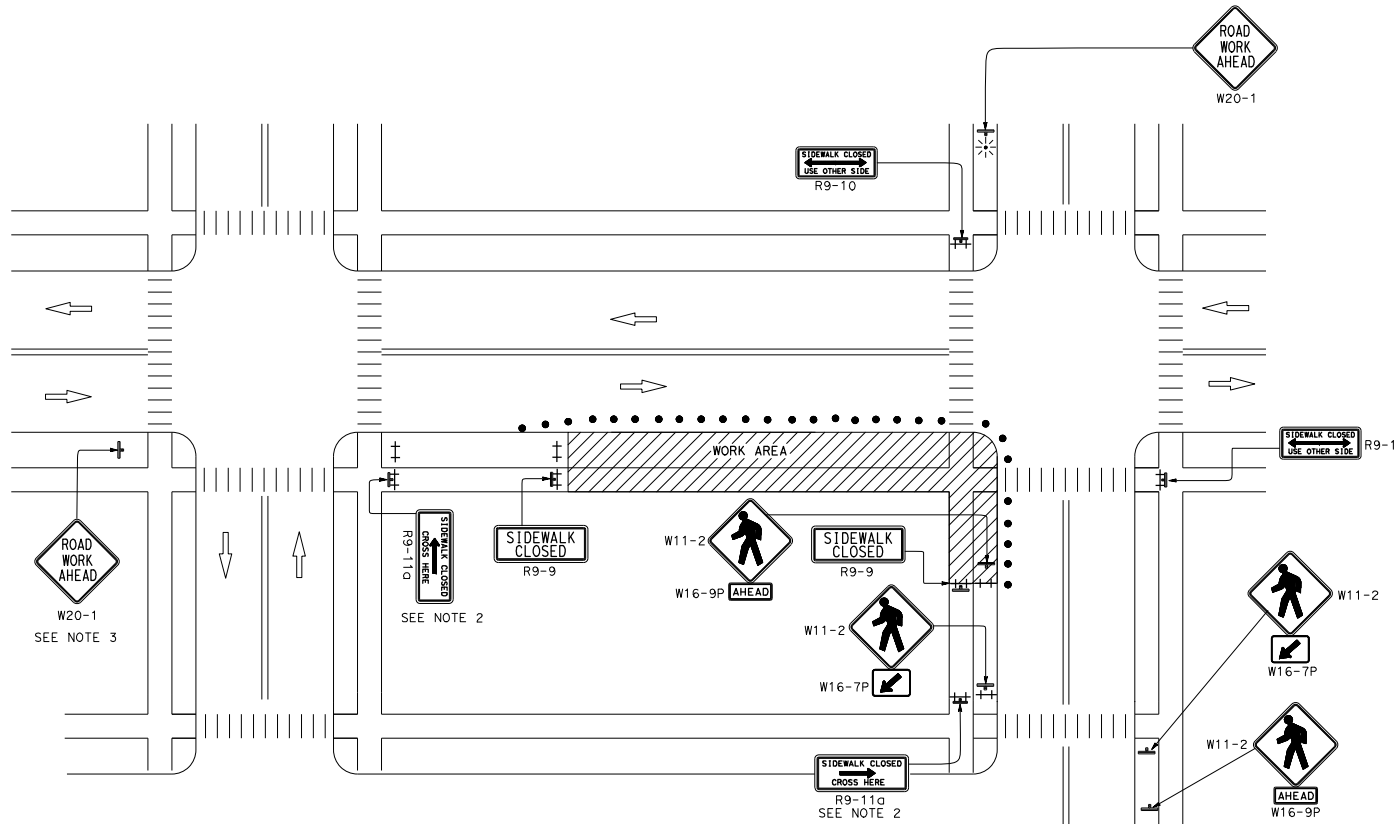
**NOTES:**

See Standard Plan T9 for tables.  
 Use cone spacing X for taper segment, Y for tangent segment or Z for conflict situations, as appropriate, per Table 1 unless X,Y, or Z cone spacing is shown on this sheet.

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS

*Charles D. Suszko*  
 REGISTERED CIVIL ENGINEER  
 No. C43029  
 Exp. 3-31-24  
 CIVIL  
 STATE OF CALIFORNIA

May 1, 2023  
 PLANS APPROVAL DATE  
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



**LEGEND:**

- † BARRICADE
- TRAFFIC CONE
- ⊛ PORTABLE FLASHING BEACON
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN
- ⊥ TEMPORARY TRAFFIC CONTROL SIGN ON BARRICADE

**SIGN PANEL SIZE (Min)**

SIGN DESIGNATION	SIGN OR PLAQUE	SIGN SIZE
R9-9	SIDEWALK CLOSED	24" x 12"
R9-10	SIDEWALK CLOSED USE OTHER SIDE	24" x 12"
R9-11	SIDEWALK CLOSED AHEAD CROSS HERE	24" x 18"
R9-11a	SIDEWALK CLOSED CROSS HERE	24" x 12"
W11-2	PEDESTRIAN	36" x 36"
W16-7P	DIAGONAL DOWNWARD POINTING ARROW (PLAQUE)	24" x 12"
W16-9P	AHEAD (PLAQUE)	24" x 12"
W20-1	ROAD WORK AHEAD	36" x 36"

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TEMPORARY PEDESTRIAN ACCESS ROUTES  
 TYPICAL SIDEWALK/CROSSWALK CLOSURE  
 AND PEDESTRIAN DETOUR**

NO SCALE

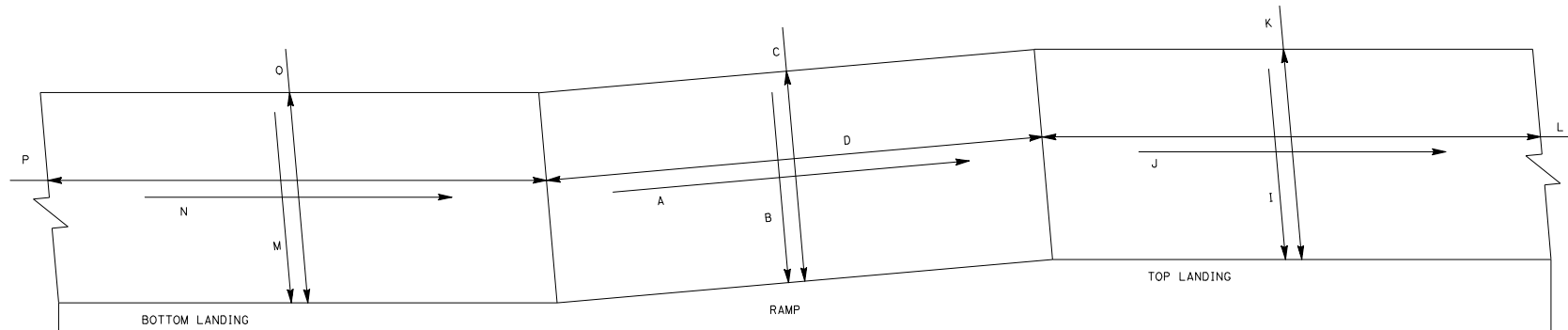
**T32**

347

2023 STANDARD PLAN T32

D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
<p><i>Charles D. Suszko</i> REGISTERED CIVIL ENGINEER</p> <p>May 1, 2023 PLANS APPROVAL DATE</p> <p>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</p>					
<p>REGISTERED PROFESSIONAL ENGINEER Charles D. Suszko No. C43029 Exp. 3-31-24 CIVIL STATE OF CALIFORNIA</p>					

RAMP				HAND RAIL		EDGE PROTECTION	
SLOPE	CROSS SLOPE	WIDTH	LENGTH	HEIGHT RIGHT SIDE	HEIGHT LEFT SIDE	RAIL RIGHT SIDE	RAIL LEFT SIDE
A	B	C	D	E	F	G	H
8.3% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	30 FEET OR LESS	34 TO 38 INCHES	34 TO 38 INCHES	WITHIN 2 INCHES FROM GROUND	WITHIN 2 INCHES FROM GROUND
TOP LANDING				BOTTOM LANDING			
CROSS SLOPE	SLOPE	WIDTH	DEPTH	CROSS SLOPE	SLOPE	WIDTH	DEPTH
I	J	K	L	M	N	O	P
2.0% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	60 INCHES OR GREATER	2.0% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	60 INCHES OR GREATER



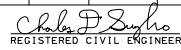
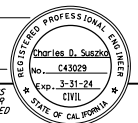
STATE OF CALIFORNIA  
DEPARTMENT OF TRANSPORTATION  
**TEMPORARY PEDESTRIAN  
ACCESS ROUTES  
RAMP**  
NO SCALE

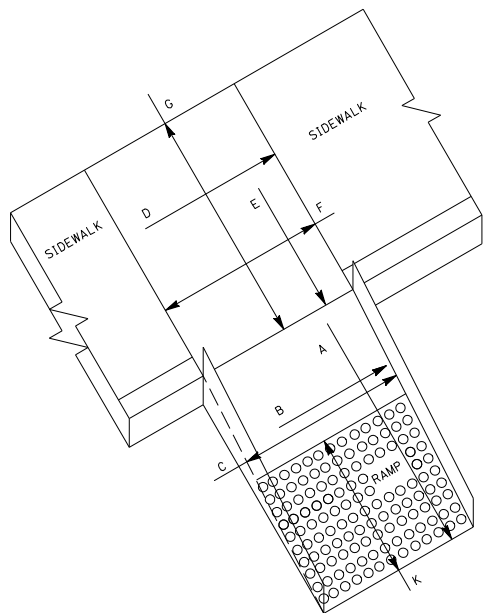
**T33**

349

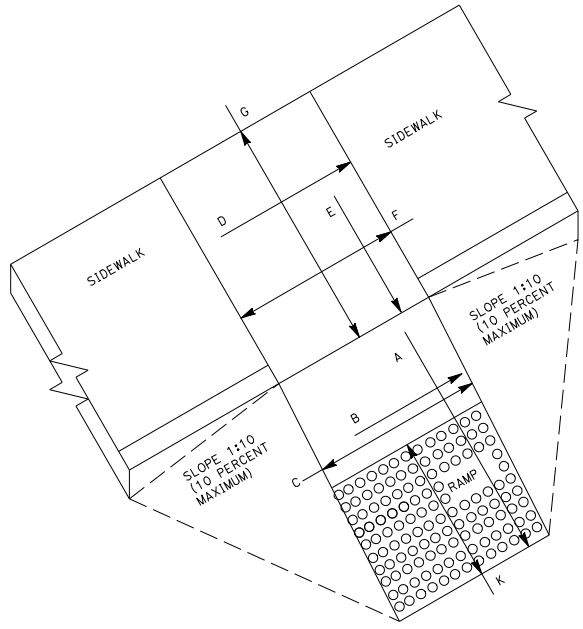
CURB RAMP			TOP LANDING				DETECTABLE WARNING SURFACE
SLOPE	CROSS SLOPE	WIDTH	CROSS SLOPE	SLOPE	WIDTH	DEPTH	DEPTH
A	B	C	D	E	F	G	K
8.3% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	2.0% OR LESS	2.0% OR LESS	48 INCHES OR GREATER	60 INCHES OR GREATER	MINIMUM 36 INCHES

NOTES: If the above requirements cannot be met, on existing sites with space limitations, the following slopes are allowed:  
 For a maximum rise of 6 inches a slope between 1:12 to 1:10 is allowed.  
 For a maximum rise of 3 inches a slope between 1:10 to 1:8 is allowed.

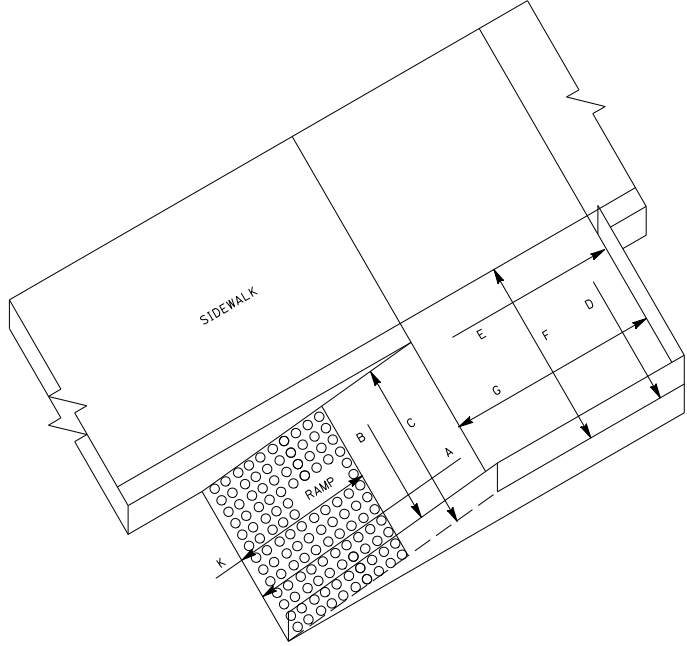
D16+	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET TOTAL NO. SHEETS
 REGISTERED CIVIL ENGINEER				
May 1, 2023 PLANS APPROVAL DATE				
<small>THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.</small>				



OPTION A  
SHOWN WITH SIDE EDGE



OPTION B  
SHOWN WITH SIDE APRON



OPTION C  
PARALLEL RAMP  
SHOWN WITH SIDE EDGE

STATE OF CALIFORNIA  
 DEPARTMENT OF TRANSPORTATION  
**TEMPORARY PEDESTRIAN  
 ACCESS ROUTES  
 CURB RAMP OPTIONS**  
 NO SCALE

**T34**

2023 STANDARD PLAN T34

## PUBLIC AFFAIRS - PERMITTED ACTIVITY NOTIFICATION

This Project Notification must be emailed to Public Affairs Team as early as possible (One Week Ahead is Best) prior to the start of any permitted activity. Please fill out this form as thoroughly as possible and use additional paper if needed. **Include all information that the traveling public needs to know.** Project photos encouraged.

TO: PUBLIC AFFAIRS

Genelle Padilla (San Luis Obispo & Santa Barbara County) [genelle.padilla@dot.ca.gov](mailto:genelle.padilla@dot.ca.gov)

Kevin Drabinski (Monterey and Santa Cruz County) [kevin.drabinski@dot.ca.gov](mailto:kevin.drabinski@dot.ca.gov)

Heidi Crawford (San Benito County) [heidi.crawford@dot.ca.gov](mailto:heidi.crawford@dot.ca.gov)

Jillian Davis (Student Assistant) [jillian.davis@dot.ca.gov](mailto:jillian.davis@dot.ca.gov)

Jim Shivers (PIO Chief) [jim.shivers@dot.ca.gov](mailto:jim.shivers@dot.ca.gov)

General Public Information Office (PIO) Email: [info-d5@dot.ca.gov](mailto:info-d5@dot.ca.gov)

General PIO Phone: (805) 549-3318

E.A. or PERMIT NUMBER: **05-23-N-UT-0121**

COUNTY, ROUTE & POSTMILE: **05-SB-1-49.95**

PERMITTED ACTIVITY LIMITS (location in miles, distance from nearest landmarks or cities, etc.):

PROJECT DESCRIPTION AND PURPOSE FOR PROJECT:

Installation of approximately 130 feet of 4-inch force main as shown on the attached plans and as directed by the permit provisions in US Highway 1 right of way at postmile 49.95 in the County of Santa Barbara.

PERMIT INSPECTOR: **Payman Hamed** PHONE: **(805) 276-1570** FAX:

CONTRACTOR: FROM (CITY)

PERMIT ESTIMATE AMOUNT:

ANTICIPATED DATE TO \*BEGIN CONSTRUCTION:

ALLOTTED WORKING DAYS:

ANTICIPATED \*COMPLETION DATE:

ANTICIPATED TRAFFIC CONTROL & HOURS OF CLOSURE:

ANTICIPATED TRAFFIC DELAYS:

ANY IMPACTS TO BICYCLE RIDERS/PEDESTRIANS:

COMMENTS: (What else does the public need to know? Diagrams, maps also helpful.)

\*Please let Public Affairs know of any changes in Startup or Completion dates.

**NOTICE OF MATERIALS TO BE USED**

CEM-3101 (REV 09/2015) CT#7541-3511-1

**NOTICE OF MATERIALS TO BE USED  
INSTRUCTIONS TO PERMITTEE/CONTRACTOR**

Section 6 of the *State Standard Specifications* states that, "Before the preconstruction conference, submit material source information on a Notice of Materials to Be Used form".

To avoid delay in approval of materials, the Department of Transportation must receive, in a timely manner, Form CEM-3101, "Notice of Materials to Be Used." When filing this form, please comply with the following instructions:

1. The Contract Number/Permit Number and job limits should be the same as they appear on the special provisions/encroachment permit.
2. The column headed "Contract Bid Item Number" refers to the sequential item number of the contract, *if applicable*.
3. The column headed "Item Code" refers to the number for which the material is to be used, *if applicable*. It is a six-digit number.
4. The column headed "Contract Item Description" refers to an item description of the material as described in the special provisions or an item description to be used on the permitted project.
5. The columns headed "Item Component" refer to the specific description of material to be used, not necessarily the name of the contract item.

For Example:

<b>Contract Bid Item Number</b>	<b>Item Code</b>	<b>Contract Item Description</b>	<b>Item Component</b>	<b>Item Sub-Component</b>
1	520101	Bar Reinforcing steel	Coupler (service splice)	Service Splice, CJP welded

6. The column headed "Manufacturer/Provider" refers to the manufacturer/fabricator of the item. List the name, address, and email of the Manufacturer/Fabricator. Also, list the name and address of the location where inspection will occur, if different from the Manufacturer/Fabricator.
7. Form CEM-3101, "Notice of Materials to Be Used," must be submitted to the resident engineer (RE). The RE will email Form CEM-3101 to the materials administrator to:

[MaterialsAdministratorMETS@dot.ca.gov](mailto:MaterialsAdministratorMETS@dot.ca.gov) or fax to (916) 227-7084, Attn: Materials Administrator or postal mail to: Materials Engineering and Testing Services, 5900 Folsom Blvd., Sacramento, CA 95819, MS-5.

If the sources of materials are not known at the beginning of a contract, submit a Form CEM-3101, "Notice of Materials to Be Used," for a given bid item as soon as a provider is known. Multiple submissions may be necessary. Submit a Form CEM-3101, "Notice of Materials to Be Used," for all changes or revisions.

When placing orders for materials that require inspection prior to shipment, be sure to indicate on your request form that state inspection is required before shipment.

**ADA Notice**

For individuals with sensory disabilities, this document is available in alternate formats. For alternate format information, contact the Forms Management Unit at (916) 445-1233, TTY 711, or write to Records and Forms Management, 1120 N Street, MS-89, Sacramento, CA 95814.

Resident Engineer: **Caltrans Permit Inspector - Payman Hamed**

Date:

Materials required for use under Contract Number <sup>(1)</sup> **Encroachment Permit Number - 05-23-N-UT-0121**

District: **05** County: **SB** Route: **1** Post Mile: **49.95**

will be obtained from the following sources:

Contract Bid Item Number (2)	Item Code (3)	Contract Item Description (4)	Item Component (5)	Manufacturer/Provider Name and Address (5)	Manufacturer/Provider Email Address (6)

It is requested that you arrange for sampling, testing and inspection of materials prior to delivery in accordance with Section 6 of the *Standard Specifications*. It is understood that source inspection does not relieve the prime contractor of the full responsibility for incorporating into the work, materials that comply in all respects with the contract plans and specifications, nor does it preclude the subsequent rejection of materials found to be unsuitable.

(7) Copies: Materials Administrator, Mail Station #5  
 Materials Engineering & Testing Services  
 5900 Folsom Blvd, Sacramento, CA 95819  
[MaterialsAdministratorMETS@dot.ca.gov](mailto:MaterialsAdministratorMETS@dot.ca.gov)  
 Fax: (916) 227-7084

Contractor		
Address		
Business Phone	Business Fax	E-Mail Address



**ENCROACHMENT PERMIT APPLICANT: CONTRACTOR(S) AUTHORIZATION FORM**

DOT TR-0429 (NEW 12/2022)

The Permittee warrants and represents the Permittee has hired the following prime contractor(s) to perform the approved encroachment activities under Encroachment Permit # \_\_\_\_\_ on the Permittee's behalf as agents in accordance with Encroachment Permit General Provision #4 or Adopt-A-Highway Special Provision # 3, whichever is part of the Encroachment Permit. The Permittee warrants and represents the Permittee has provided a copy of the Encroachment Permit to the prime contractor(s) listed below, and further warrants and represents that the activities related to the Encroachment Permit, whether performed by the Permittee or by the prime contractor(s) below or by any person or entity acting for or on behalf of the Permittee, will be performed in compliance with all terms, conditions, specifications, standards, provisions, and other requirements of the subject Encroachment Permit. The person signing below warrants and represents such person has authority on behalf of the Permittee to make the warranties and representations contained herein, and to agree to and so bind the Permittee to this page.

**List of authorized prime contractors for the encroachment permit:**

Contractor Name	Scope of work (Traffic Control/civil work etc.)	Contact Person	Contact Person's Information (Phone # and E-mail)

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

\_\_\_\_\_  
Name of Permittee

\_\_\_\_\_  
Name and Title of Person Signing for Permittee (Print)

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

# ENCROACHMENT PERMIT APPLICANT: CONTRACTOR(S) AUTHORIZATION FORM

DOT TR-0429 (NEW 12/2022)

By signing below, each prime contractor acknowledges that such prime contractor has received a copy of Encroachment Permit # \_\_\_\_\_ and agrees such prime contractor, and such prime contractor's employees, managers, officers, directors, agents, subcontractors, and suppliers, will comply with, and will perform all activities in accordance with, all terms, conditions, specifications, standards, provisions, and other requirements of the Encroachment Permit, including but not limited to notifying the permit inspector as required in the Encroachment Permit and reporting the lane closure notifications per the Encroachment Permit General Provisions (TR-0045). Each person signing on behalf of each prime contractor warrants and represents such person has the authority to make the acknowledgements, warranties, and representations contained herein on behalf of the named prime contractor, and has the authority to agree to and so bind the named prime contractor to this page.

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

Name of Prime Contractor	Name and Title of Person Signing for Contractor (Print)	Signature	Date
Name of Prime Contractor	Name and Title of Person Signing for Contractor (Print)	Signature	Date
Name of Prime Contractor	Name and Title of Person Signing for Contractor (Print)	Signature	Date
Name of Prime Contractor	Name and Title of Person Signing for Contractor (Print)	Signature	Date

At the completion of the permitted work, please complete the form below and submit an electronic copy of this page sent by email to Marshall.Etrata@dot.ca.gov.

STATE OF CALIFORNIA • DEPARTMENT OF TRANSPORTATION

**NOTICE OF COMPLETION**

TR-0128 (REV. 6/2001) CT #7541-5529-1

PERMIT # 05-23-N-UT-0121

Permit Inspector: Payman Hamed

Dear Sir or Madam:

All work authorized by the above numbered permit was completed on:

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

SIGNATURE OF PERMITTEE: \_\_\_\_\_

City of Guadalupe

FM 92 1546 M

**ADA Notice**

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**STANDARD ENCROACHMENT PERMIT APPLICATION**

DOT TR-0100 (REV 05/2023)

FOR CALTRANS USE

TRACKING NO.

0523-NUT-0121

DIST/CO/RTE/PM

05/SB/1/49.95

SIMPLEX STAMP

**Complete ALL fields, write "N/A" if not applicable. Type or print clearly.**

This application is not complete until all requirements have been approved.

Permission is requested to encroach on the State Highway right-of-way as follows:

1. COUNTY SANTA BARBARA	2. ROUTE 1	3. POST MILE 49.8	
4. ADDRESS OR STREET NAME GUADALUPE ST/HIGHWAY 1	5. CITY GUADALUPE		
6. CROSS STREET (Distance and direction from project site) 8TH STREET			DATE OF SIMPLEX STAMP 3/7/2023
7. WORK TO BE PERFORMED BY <input type="checkbox"/> APPLICANT <input checked="" type="checkbox"/> CONTRACTOR		8. IS THIS APPLICATION FOR A RIDER? <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES. If "YES", provide the Parent Permit Number	
9. ESTIMATE START DATE SEPTEMBER 2024		10. ESTIMATED COMPLETION DATE 09/30/2025	
11. ESTIMATED NUMBER OF WORKING DAYS WITHIN STATE HIGHWAY RIGHT-OF-WAY 30			
12. ESTIMATED CONSTRUCTION COSTS WITHIN STATE HIGHWAY RIGHT-OF-WAY \$50,000			
13. HAS THE PROJECT BEEN REVIEWED BY ANOTHER CALTRANS BRANCH? <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES. If "YES", which branch?			
14. FUNDING SOURCE(S) <input type="checkbox"/> FEDERAL <input checked="" type="checkbox"/> STATE <input type="checkbox"/> LOCAL <input checked="" type="checkbox"/> PRIVATE <input type="checkbox"/> SB 1 (ROAD REPAIR AND ACCOUNTABILITY ACT OF 2017)			
15. CALTRANS PROJECT CODE (ID) N/A		16. APPLICANT'S REFERENCE / UTILITY WORK ORDER NUMBER PIONEER LIFT STATION REPLACEMENT PROJECT	

17. DESCRIBE WORK TO BE DONE WITHIN STATE HIGHWAY RIGHT-OF-WAY (in 20 lines or less)

Attach 6 complete sets of plans (folded to 8.5" x 11") and any applicable specifications, calculations, maps, traffic control plans, etc.

The existing facility is a confined space safety hazard. The pumps are oversized for existing flows. The force main is not located within the City easement. The lift station replacement project includes above grade or submersible pump installation to remove the confined space hazard. The pumps will be replaced with appropriately sized pumps. The force main will be rerouted to City right-of-way. The work in the Caltrans right-of-way includes the installation of approximately 130 feet of 4-inch force main. The force main will convey sewage.

18 (a). PORTION OF STATE HIGHWAY RIGHT-OF-WAY WHERE WORK IS BEING PROPOSED (check all that apply)

 Traffic lane  Shoulder  Sidewalk  Median  At or near an intersection  Mobile work Outside of the shoulder, \_\_\_\_\_ feet from edge of pavement  Other \_\_\_\_\_

18 (b). PROPOSED TRAFFIC CONTROL PLANS AND METHOD

 No traffic control needed  State Standard Plans (T-Sheets) # \_\_\_\_\_ Project specific Traffic Control Plans included  To be submitted by contractor**ADA Notice**

This document is available in alternative accessible formats. For more information, please contact the Forms Management Unit at (279) 234-2284, TTY 711, in writing at Forms Management Unit, 1120 N Street, MS-89, Sacramento, CA 95814, or by email at Forms.Management.Unit@dot.ca.gov.

**STANDARD ENCROACHMENT PERMIT APPLICATION**

DOT TR-0100 (REV 05/2023)

TRACKING NO.

0523-NUT-0121

19. EXCAVATION	MAX. DEPTH (in) 120	MIN. DEPTH (in) 48	AVG. WIDTH (in) 48	LENGTH (ft) 130	SURFACE TYPE (e.g. Asphalt, concrete, soil, etc.) Asphalt
20. PIPES	PRODUCT BEING TRANSPORTED Sewage	CARRIER PIPE DIAMETER 4 (in.) MATERIAL PVC			CASING PIPE DIAMETER N/A (in.) MATERIAL N/A
PROPOSED INSTALLATION METHOD (e.g. HDD, Bore & Jack, Open Cut, etc.) Open Cut					VOLTAGE / PSIG 20 psig

DOES THE PROPOSED PROJECT INVOLVE THE REPLACEMENT AND/OR ABANDONMENT OF AN EXISTING FACILITY?

 NO  YES. If "YES", provide a description Replace existing lift station and abandon the existing force main

21. IS A CITY, COUNTY OR OTHER PUBLIC AGENCY INVOLVED IN THE APPROVAL OF THIS PROJECT?

 YES (if "YES", check the type of project AND attach the environmental documentation and conditions of approval) COMMERCIAL DEVELOPMENT  BUILDING  GRADING  OTHER \_\_\_\_\_ CATEGORICALLY EXEMPT  NEGATIVE DECLARATION  ENVIRONMENTAL IMPACT REPORT  OTHER \_\_\_\_\_ NO (if "NO", check the category below which best describes the project AND answer questions A-K) DRIVEWAY OR ROAD APPROACH, RECONSTRUCTION,  
MAINTENANCE OR RESURFACING FENCE  EROSION CONTROL PUBLIC UTILITY MODIFICATION, EXTENSIONS, HOOKUPS MAILBOX  LANDSCAPING FLAGS, SIGNS, BANNERS, DECORATIONS, PARADES AND CELEBRATIONS  OTHER \_\_\_\_\_**The following questions must be answered when a City, County or other public agency IS NOT involved in the approval of this project.**

Your answers to these questions will assist Caltrans staff in identifying any physical, biological, social or economic resources that may be affected by your proposed project within State Highway right-of-way and to determine which type of environmental studies may be required to approve your application for an encroachment permit. It is the applicant's responsibility for the production of all required environmental documentation and supporting studies and in some cases this may be costly and time consuming. If possible, attach photographs of the location of the proposed project. Answer these questions to the best of your ability. Provide a description of any "YES" answers (type, name, number, etc.).

A. Will any existing vegetation and/or landscaping within State Highway right-of-way be disturbed?

N/A

B. Are there waterways (e.g. river, creek, pond, natural pool or dry streambed) adjacent to or within the limits of the proposed project?

N/A

C. Is the proposed project located within five miles of the coast line?

N/A

D. Will the proposed project generate construction noise levels greater than 86 decibels (dBA) (e.g. Jack-hammering, pile driving)?

N/A

E. Will the proposed project incorporate land from a public park, recreation area or wildlife refuge open to the public?

N/A

F. Are there any recreational trails or paths within the limits of the proposed project?

N/A

G. Will the proposed project impact any structures, buildings, rail lines or bridges within State Highway right-of-way?

N/A

H. Will the proposed project impact access to any businesses or residences?

N/A

I. Will the proposed project impact any existing public utilities or public services?

N/A

J. Will the proposed project impact any existing pedestrian facilities, such as sidewalks, crosswalks or overcrossings?

N/A

K. Will new lighting be constructed within or adjacent to State Highway right-of-way?

N/A

**ADA Notice**

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**STANDARD ENCROACHMENT PERMIT APPLICATION**

DOT TR-0100 (REV 05/2023)

TRACKING NO.

0523-NUT-0121

22. Will the proposed project cause a substantial change in the significance of a historical resource (45 years or older), or cultural resource?  YES  NO (if "YES", provide a description)

23. Will the proposed project be on an existing State Highway or street where the activity involves removal of a scenic resource? (e.g. A significant tree or stand of trees, a rock outcropping or a historic building)  YES  NO (if "YES", provide a description)

24. Is work being done on the applicant's property in addition to State Highway right-of-way?  YES  NO  
(If "YES", attach 6 complete sets of site and grading plans)

25. Will the proposed project require the disturbance of soil?  YES  NO

If "YES", estimate the area of disturbed soil within State Highway right-of-way in acres: 0.02

and estimate the area of disturbed soil outside State Highway right-of-way in acres: 0.06

26. Will the proposed project require dewatering?  YES  NO

If "YES", estimate Total gallons AND gallons/month. 400,000 (Total gallons) AND 400,00 (gallons/month)

SOURCE\*:  STORMWATER  NON-STORMWATER

(\*See Caltrans SWMP for definition of non-storm water discharge:

<https://www.dot.ca.gov/programs/environmental-analysis/stormwater-management-program>)

27. How will any storm water or ground water be disposed?

Storm Drain System  Combined Sewer / Stormwater System  Stormwater Retention Basin  N/A

Other (explain) \_\_\_\_\_

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TRACKING NO.  
 0523-NUT-0121


**READ THE FOLLOWING CLAUSES PRIOR TO SIGNING THIS ENCROACHMENT PERMIT APPLICATION.**

The applicant's submission of this application to the California Department of Transportation constitutes the applicant's agreement and representation that the work or other activity contemplated by the encroachment permit application shall comply with all applicable standards, specifications, policies, requirements, conditions, and regulations of the California Department of Transportation, and the applicant understands the application may be denied if there is non-compliance with any of the above. An exception process exists and may result in approval of a non-compliant encroachment, in the discretion of the California Department of Transportation, but the exception process may require additional time to complete. The applicant understands and agrees all work or other activity contemplated by the encroachment permit application is subject to inspection and oversight by the California Department of Transportation. The applicant understands and agrees encroachment permit fees must still be paid if an application is withdrawn or denied. The applicant understands a denial may be appealed, in accordance with California Streets and Highways Code, Section 671.5, and the related regulations found in California Code of Regulations, Title 21, Division 2, Chapter 8, Article 2.

The applicant understands and agrees that immediately upon issuance of the encroachment permit the applicant is bound by, subject to, and must comply with the "Encroachment Permit General Provisions" (TR-0045), "Stormwater Special Provisions" (TR-0400) and any other applicable Special Provisions and Conditions of the encroachment permit. The "Encroachment Permit General Provisions" (TR-0045), and the Stormwater Special Provisions (TR-0400) are available at: <https://dot.ca.gov/-/media/dot-media/programs/traffic-operations/documents/encroachment-permits/appendix-k-ada-a11y.pdf>. If a paper copy is needed of the "Encroachment Permit General Provisions" (TR-0045) and/or "Stormwater Special Provisions" (TR-0400), please contact the District Office of Encroachment Permits. Their contact information is available at: <https://dot.ca.gov/programs/traffic-operations/ep/district-contacts>. The "Encroachment Permit General Provisions" (TR-0045) and any other applicable Special Provisions and Conditions will be provided as part of the encroachment permit. Information about Stormwater requirements is available at the Internet address: <https://dot.ca.gov/programs/environmental-analysis/stormwater-management-program>.

The applicant understands an encroachment permit may be denied, revoked, and/or a bond may be required, for non-payment of prior or present encroachment permit fees. An encroachment permit is not a property right and does not transfer with the property to a new owner.

Each of the persons purporting to execute this application on behalf of the applicant and/or on behalf of the applicant's authorized agent or engineer represents and warrants such person has full and complete legal authority to do so and to thereby bind applicant to the terms and conditions herein and to the terms and/or conditions of the encroachment permit. Applicant understands and agrees this application may be executed in one or more counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument. Executed copies of this application and/or its counterparts may be reproduced and/or exchanged by copy machine, mailing, facsimile, or electronic means (such as e-mail), and such copies shall be deemed to be effective as originals.

28. NAME OF APPLICANT (Project or Property Owner or Organization) CITY OF GUADALUPE		
ADDRESS OF APPLICANT (Include City, State and Zip Code) 918 OBISPO STREET		
E-MAIL ADDRESS tbodem@ci.guadalupe.ca.us	PHONE NUMBER 805-356-3891	FAX NUMBER 805-343-5512
29. NAME OF AUTHORIZED AGENT / ENGINEER (A "Letter of Authorization" is required if different from #28) Jeff van den Eikhof		IS A LETTER OF AUTHORIZATION ATTACHED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
ADDRESS OF AUTHORIZED AGENT / ENGINEER (Include City, State and Zip Code) 4875 El Camino Real, Atascadero, CA 93422		
E-MAIL ADDRESS jeff@eikhofdesigngroup.com	PHONE NUMBER 805-470-1910	FAX NUMBER
30. NAME OF BILLING CONTACT (Same as #28 <input checked="" type="checkbox"/> Same as #29 <input type="checkbox"/> N/A		
BILLING ADDRESS WHERE INVOICE(S) IS / ARE TO BE MAILED (Include City, State and Zip Code) N/A		
E-MAIL ADDRESS N/A	PHONE NUMBER N/A	FAX NUMBER N/A
* I hereby certify under penalty of perjury under the laws of the State of California that the information in this application and any document submitted with or in support of this application are true and correct to the best of my knowledge and belief, and that copies of any documents submitted with or in support of this application are true and correct copies of unaltered original documents. I further understand that if I have provided information that is false, intentionally incomplete, or misleading I may be charged with a crime and subjected to fine or imprisonment, or both fine and imprisonment. (Penal Code Section 72)		
31. SIGNATURE OF APPLICANT OR AUTHORIZED AGENT* 	32. PRINT OR TYPE NAME Jeff van den Eikhof	
33. TITLE City Engineer	34. DATE 05/28/2024	

**DEPARTMENT OF TRANSPORTATION**

ENCROACHMENT PERMIT OFFICE  
 50 HIGUERA STREET  
 SAN LUIS OBISPO, CA 93401-5415  
 PHONE (805) 549-3152  
 FAX (805) 549-3062  
 TTY 711  
<http://www.dot.ca.gov/dist05>



*Serious drought  
 Help save water!*

**AUTHORIZATION OF AGENT**

I, the owner as the Permit Applicant or legal representative for the Permit Applicant identified below, hereby authorize my agent, listed below, to apply for a State of California Department of Transportation Encroachment Permit and act on my behalf. In completing and signing this form I acknowledge that I have reviewed the State of California Department of Transportation Standard Encroachment Permit Application Form and agree to its terms and conditions.

**Property Information, Encroachment Location, or Description**

Property Address or  
 Facility Description: Pioneer Lift Station - 8th Street and Guadalupe Street/Hwy 1

State Route Number: Highway 1

City or County: City of Guadalupe, Santa Barbara County

Additional Information: Caltrans Permit Application 0523-NUT-0121  
(Project Reference No., APN, Tract Number, Subdivision Name, etc.)

**Permit Applicant Information:**


Name: City of Guadalupe

Street Address: 918 Obispo Street

City, State, Zip Code: Guadalupe, CA 93434

Phone Number: 805-356-3891

Print Name: Todd Bodem

Signature: 

Title: City Administrator  
(Owner, Partner, Corporation Officer, Specify Other)

Date: 5-28-2024

**Agent Information:**

Name: Jeff van den Eikhof

Firm Name: Eikhof Design Group, Inc.

Street Address: 4875 El Camino Real

City, State, Zip Code: Atascadero, CA 93422

Phone Number: 805-470-1910

Print Name: Jeff van den Eikhof

Signature of Agent: 

Date: 5/28/2024

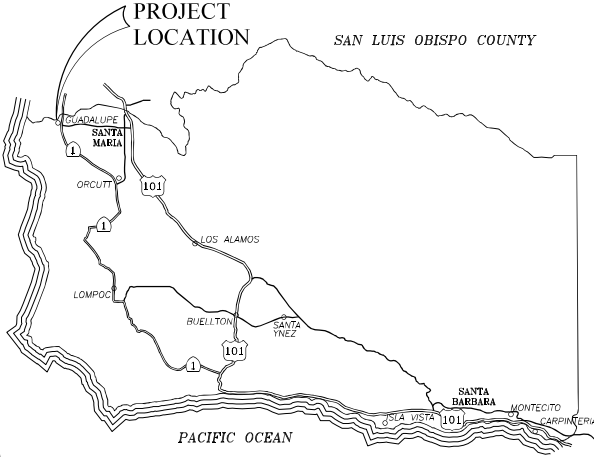


CONSTRUCTION PLANS FOR  
CITY OF GUADALUPE, CALIFORNIA

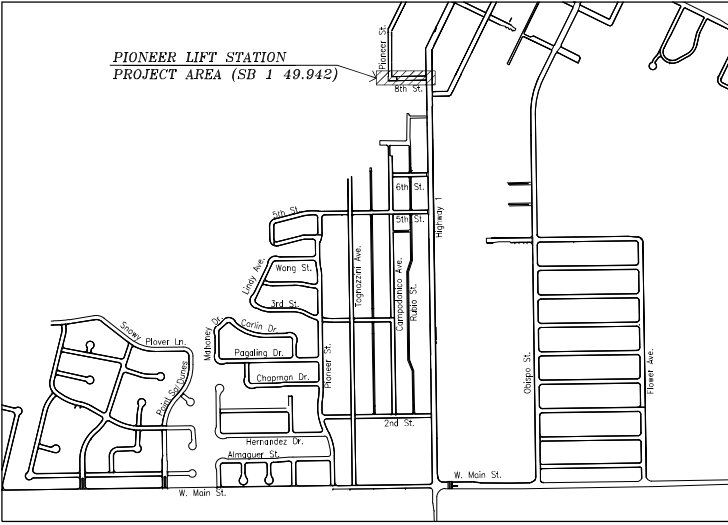
# PIONEER LIFT STATION AND FORCE MAIN PROJECT

JUNE 2024

CALTRANS PERMIT:  
0523-NUT-0121



VICINITY MAP  
N.T.S.

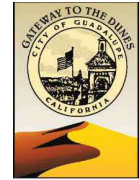


LOCATION MAP  
N.T.S.

SHEET INDEX		
SHEET NUMBER	DRAWING NUMBER	SHEET TITLE
1	G-001	TITLE SHEET AND SHEET INDEX
2	G-002	NOTES, ABBREVIATIONS, AND LEGEND
3	G-003	SURVEY CONTROL DATA
4	C-101	PIONEER LIFT STATION - DEMOLITION PLAN
5	C-102	PIONEER LIFT STATION - SITE PLAN
6	C-103	PIONEER LIFT STATION - SECTION VIEW
7	C-104	PIONEER LIFT STATION FORCE MAIN - PLAN AND PROFILE
8	C-501	CIVIL DETAILS - 1
9	C-502	CIVIL DETAILS - 2
10	C-503	CIVIL DETAILS - 3
11	C-504	CIVIL DETAILS - 4
12	C-505	CIVIL DETAILS - 5
13	E-001	SYMBOL LISTS, SEISMIC NOTES, LUMINAIRE SCHEDULE
14	E-002	ONE LINE DIAGRAM, PUMP CONTROL DIAGRAM
15	E-101	LIFT STATION ELECTRICAL AND SITE PLANS
16	E-201	DETAILS

DATE: \\net\proj\proj\mkn\proj\0523-NUT-0121\Drawings\101-001-001.dwg, Date Plotted: 06/25/2024 10:58:00 AM, Plotter: HP DesignJet T1100e, Plot Style: mkn.ctb, User: jay@mkngroup.com, Job Number: 0523-NUT-0121, Project Name: PIONEER LIFT STATION AND FORCE MAIN PROJECT, City: GUADALUPE, State: CA, County: SAN LUIS OBISPO COUNTY, Drawing Title: TITLE SHEET AND SHEET INDEX, Drawing Number: G-001, Sheet Number: 1 OF 16

OWNER



City of Guadalupe  
918 Obispo Street  
Guadalupe, CA  
Tel. (805) 356-3891  
Fax (805) 343-5512

PROJECT  
**PIONEER LIFT STATION  
AND FORCE MAIN  
PROJECT**


REVIEWED BY:   
Date: 06/25/2024

**mkn**  
P.O. BOX 1604  
ARROYO GRANDE, CA 93421 (805) 904-8530

ENGINEER OF RECORD



Joseph J. Reichmuth, PE  
No. C63124

DATE: JUNE 2024

SHEET: **G-001**  
1 OF 16

**GENERAL NOTES**

- STATIONING AND DISTANCES SHOWN ON THE DRAWINGS ARE BASED ON HORIZONTAL MEASUREMENTS PROJECTED FROM THE PIPE CENTERLINE UNLESS NOTED OTHERWISE.
- THE CONTRACTOR SHALL HAVE COPIES OF THE PLANS AND SPECIFICATIONS FOR THIS PROJECT ON-SITE DURING CONSTRUCTION AND SHALL BE FAMILIAR WITH ALL APPLICABLE STANDARDS AND SPECIFICATIONS.
- STRUCTURAL CONCRETE SHALL BE CLASS "A" 4000 PSI UNLESS INDICATED OTHERWISE, SEE SPECIFICATION SECTION 030500.
- VERIFY DIMENSIONS AND CONDITIONS AT THE SITE BEFORE STARTING WORK. ANY CONFLICTS BETWEEN DETAILS OR DIMENSIONS ON THE DRAWINGS SHALL BE REPORTED PROMPTLY TO THE OWNER'S REPRESENTATIVE WHO WILL DETERMINE THE INTENT OF THE DRAWINGS.
- UTILITIES, BOTH EXISTING AND THOSE NOTED AS FUTURE WHICH MAY OR MAY NOT EXIST AT THE TIME OF CONSTRUCTION, ARE SHOWN ON THESE PLANS FOR THE CONVENIENCE OF THE CONTRACTOR. SUBSURFACE UTILITY DATA ARE DEPICTED TO LEVEL "C" AS DEFINED IN "STANDARD GUIDELINE FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA", CI/ASCE 38-02, NOT ALL LATERALS ARE SHOWN.
- TAKE PRECAUTIONARY MEASURES TO PROTECT UTILITIES AND STRUCTURES SHOWN AS WELL AS ANY AND ALL OTHERS NOT ON RECORD DRAWINGS OR NOT SHOWN ON THESE PLANS. PERFORM INDEPENDENT INVESTIGATIONS (POTHOLES), TO DETERMINE LOCATIONS AND SIZES OF EXISTING UTILITIES. NOTIFY OWNERS REPRESENTATIVE BY TELEPHONE AND IN WRITING OF ANY DISCREPANCIES. ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO ORIGINAL CONDITION AND/OR THE APPLICABLE REQUIREMENTS OF THE AFFECTED UTILITY AT THE CONTRACTOR'S EXPENSE. APPROVAL BY THE UTILITY OWNER SHALL ALSO BE REQUIRED.
- COORDINATE UNDERGROUND UTILITY MARKING WITH THE LOCAL UNDERGROUND SERVICE ALERT JURISDICTION (CALL 811) PRIOR TO CONSTRUCTION.
- USE EXTREME CAUTION WHEN WORKING NEAR OVERHEAD OR UNDERGROUND POWER, GAS, OR OTHER UTILITIES SO AS TO SAFELY PROTECT ALL PERSONNEL AND EQUIPMENT. PROTECT FROM DAMAGE INCURRED DURING CONSTRUCTION ALL OVERHEAD UTILITY LINES WHETHER SHOWN OR NOT SHOWN ON THESE PLANS. NOTIFY UTILITY COMPANIES PRIOR TO ANY WORK IN OVERHEAD LOCATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR COST INCURRED.
- PRESERVE ALL SURVEY MARKERS AND MONUMENTS, THOSE REQUIRING REMOVAL SHALL BE RE-ESTABLISHED IN ACCORDANCE WITH THE LOCAL GOVERNING AUTHORITY REQUIREMENTS.
- LIMIT CONSTRUCTION ACTIVITIES TO THE RIGHT-OF-WAY, EASEMENTS, AND DESIGNATED AREAS SHOWN ON THE DRAWINGS.
- COMPACTION OF BACKFILL MATERIALS SHALL BE BY MECHANICAL EQUIPMENT IN ACCORDANCE WITH SPECIFICATION SECTION 312316. NO FLOODING OR JETTING WILL BE ALLOWED.
- AT THE CLOSE OF EACH WORKING SHIFT, WHERE A NEXT SHIFT WILL NOT IMMEDIATELY FOLLOW, CONSTRUCT PIPE END CAPS AND TRENCH RAMPS AT THE END OF THE EXCAVATION OR COMPLETELY COVER WITH TRENCH PLATES. PREVENT UNAUTHORIZED ENTRY INTO THE OPEN PIPE AND TRENCH.
- INSTALL TEMPORARY 6-FOOT HIGH CHAIN LINK FENCING AROUND DESIGNATED WORK AREAS INCLUDING AROUND ALL STORAGE AREAS.
- ALL SPECIFICATIONS, DRAWINGS, AND DETAILS INCLUDED IN THE CONTRACT DOCUMENTS SHALL FULLY APPLY TO THE WORK WHETHER SPECIFICALLY REFERENCED OR NOT.
- GROUND WATER PUMPED FROM EXCAVATION MAY BE DISCHARGED IN ACCORDANCE WITH APPLICABLE PERMITS AND REGULATIONS. GROUND WATER SHALL NOT BE DISCHARGED TO THE STREET OR SURROUNDING AREA WITHOUT A PERMIT. NO DISCHARGE TO SANITARY SEWERS WILL BE ALLOWED UNLESS PRIOR WRITTEN PERMISSION IS GRANTED BY THE DISTRICT ENGINEER.
- VIDEO RECORD AND DOCUMENT THE PRE-EXISTING CONDITIONS OF LIFT STATION SITES, PIPELINE ALIGNMENT, AND PROPERTIES ADJACENT TO THE PROJECT, AND SUBMIT THE RECORDING TO THE CITY PRIOR TO THE START OF CONSTRUCTION. PROTECT ADJACENT PROPERTIES DURING WORK. RESTORE AND/OR REPAIR DAMAGE TO LANDSCAPING, PAVING, IRRIGATION, STRUCTURES, ETC., CAUSED BY THE WORK.
- MAINTAIN THE WORK AREA IN A NEAT, CLEAN, AND SANITARY CONDITION AT ALL TIMES AND TO THE SATISFACTION OF THE CITY. OWNER'S REPRESENTATIVE AND AGENCY WITH LOCAL JURISDICTION, STREETS SHALL BE KEPT CLEAN OF DEBRIS, WITH DUST AND OTHER NUISANCES BEING CONTROLLED AT ALL TIMES.
- MAINTAIN A COMPLETE AND ACCURATE RECORD OF ALL CHANGES IN CONSTRUCTION FROM THAT SHOWN IN THESE PLANS AND SPECIFICATIONS FOR THE PURPOSE OF PROVIDING A BASIS FOR RECORD DRAWINGS. THE CONTRACTOR SHALL NOTE DEVIATIONS FROM THE PLANS ON A SET OF PLANS SPECIFICALLY SET ASIDE FOR THIS PURPOSE. ANY CHANGES SHALL BE MADE ON THE ORIGINALS OF THE PLANS, NO CHANGES FROM THAT SHOWN ON THESE PLANS AND SPECIFICATIONS SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE OWNER'S REPRESENTATIVE.
- RESTORE ALL PAVEMENT, CONCRETE, ASPHALT, GRAVEL AND DRIVEWAY SURFACES REMOVED OR DAMAGED DURING CONSTRUCTION UNLESS INDICATED OTHERWISE ON THE PLANS. PAVEMENT RESTORATION ABOVE PIPELINE TRENCHES SHALL BE PER SHEET C-501. OTHER SURFACES SHALL BE RESTORED IN-KIND UNLESS INDICATED OTHERWISE.

- CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO THE HOURS REFERENCED IN THE CITY'S GENERAL CONDITIONS.
- WORK SHALL BE DONE IN ACCORDANCE WITH THE APPROPRIATE PERMITS PER SPECIFICATION SECTION 01100, COMPLY WITH REQUIREMENTS OF THE ENCROACHMENT PERMIT ISSUED BY THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION.
- IF FENCES ARE REMOVED FOR CONSTRUCTION, REPLACE WITH EQUAL OR BETTER FENCING MATERIALS.
- CONTRACTOR WORK AREA IS COMPRISED OF STATE-OF-CALIFORNIA RIGHT-OF-WAY, CITY RIGHT-OF-WAY, AND UTILITY EASEMENTS.
- SHEETING AND SHORING OF TRENCHES IS REQUIRED FOR WORKER PROTECTION IN CONFORMANCE WITH THE GENERAL CONDITIONS. SHEET AND SHORE TRENCHES TO PROTECT AGAINST:
  - DAMAGE TO UTILITIES, FACILITIES, AND PROPERTY
  - ADDITIONAL EXCAVATION AND BACKFILL
  - ADDITIONAL PAVEMENT
  - OTHER COSTS AND LIABILITIES ARISING FROM SOIL INSTABILITY
- CITY STREETS ARE TO REMAIN OPEN TO THROUGH TRAFFIC AT ALL TIMES. NO TEMPORARY OR LONG TERM PARKING OR STORAGE OF CONSTRUCTION EQUIPMENT OR MATERIALS SHALL OCCUR WITHOUT PRIOR ISSUANCE OF AN ENCROACHMENT PERMIT.
- DURING CONSTRUCTION, IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE FOR SAFE TRAFFIC CONTROL IN AND AROUND THE SITE. THIS MAY INCLUDE BUT SHALL NOT BE LIMITED TO SIGNS, FLASHING LIGHTS, BARRICADES AND FLAG PERSONS AS DIRECTED BY THE CITY ENGINEER. TRAFFIC CONTROL MEASURES SHALL COMPLY WITH CALTRANS STANDARDS.
- THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR SAFETY OF THE JOB SITE. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND SHALL NOT BE LIMITED TO NORMAL WORKING HOURS.

**SEWER NOTES**

- THE CITY OF GUADALUPE HAS ADOPTED THE CITY OF SANTA MARIA'S PUBLIC WORKS ENGINEERING STANDARDS, WHICH ARE AVAILABLE ONLINE AT THE CITY OF SANTA MARIA'S WEBSITE.
- THE CITY ENGINEER SHALL BE NOTIFIED AT LEAST SEVEN (7) WORKING DAYS PRIOR TO START OF CONSTRUCTION. TELEPHONE (805) 356-3910. CONSTRUCTION WILL NOT TAKE PLACE OUTSIDE OF THE CITY'S STANDARD WORKING HOURS OR ON WEEKENDS UNLESS SPECIFICALLY APPROVED BY CITY. A PRE-CONSTRUCTION MEETING IS REQUIRED.
- INSTALL GRAVITY SEWER PER SPECIFICATION SECTION 333112. ALL PIPING SHALL BE MANDREL INSPECTED AND TESTED FOR LEAKAGE AND INFILTRATION. ALL PIPING SHALL BE TELEVISION INSPECTED. ALL PIPING SHALL BE CLEANED IN CONFORMANCE WITH THE TECHNICAL SPECIFICATIONS.
- THE MANHOLE FRAME AND COVER AND CONCRETE SUPPORT FOR MANHOLES SHALL BE RAISED AND CONSTRUCTED TO FINISHED PAVED GRADE AFTER PAVING IS COMPLETED. THE RING SECTION SHALL NOT BE MORE THAN 18" FROM THE CONE.
- THE SEWER SYSTEM, INCLUDING LATERALS, SHALL BE TESTED FOR LEAKAGE AND INFILTRATION PRIOR TO PLACING STREET PAVEMENT PER SPECIFICATION SECTION 330130.
- EXISTING SEWER LOCATIONS AND FLOWLINE ELEVATIONS SHALL BE VERIFIED BY THE CONTRACTOR BEFORE START OF CONSTRUCTION. THE CITY SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.
- LABELLED RIM ELEVATIONS ARE APPROXIMATE. ADJUST MANHOLE FRAME AND COVER TO MATCH GRADE.
- NON-SEWER SERVICE LATERALS (WATER, GAS, ELECTRIC, COMMUNICATION, ETC.) ARE NOT ALL SHOWN ON THE PLANS. LOCATE AND PROTECT ALL SERVICE LATERALS AND UTILITIES PER SPECIFICATION SECTION 020120. REPLACE OR REPAIR LATERALS AND UTILITIES DAMAGED BY CONSTRUCTION.
- CONTRACTOR IS RESPONSIBLE FOR FLOW BYPASSING AND OTHER FLOW HANDLING MEASURES NEEDED FOR CONSTRUCTION. BYPASSING PLAN MUST BE DEVELOPED AND SUBMITTED AS DESCRIBED IN SECTION 015600.
- CONTRACTOR WILL BE LIABLE FOR FINES AND OTHER COSTS ASSOCIATED WITH SEWAGE SPILLS AND OTHER PROBLEMS CAUSED BY INADEQUATE HANDLING OF SEWER FLOWS.

**CALTRANS PERMIT:**  
**0523-NUT-0121**

**LEGEND**

SURVEY CONTROL POINT AND NUMBER UNDERGROUND GAS PAINT MARK SANITARY SEWER PAINT MARK WATER PAINT MARK UNDERGROUND TELEPHONE PAINT MARK UNDERGROUND ELECTRIC PAINT MARK UNDERGROUND FIBER OPTIC PAINT MARK TREE WITH DIAMETER NOTED WATER VALVE AIR RELEASE VALVE FIRE HYDRANT GUY POLE GUY WIRE TELEPHONE POLE	JOINT UTILITY POLE POWER POLE POLE WITH LIGHT ELECTRIC METER GAS METER TRAFFIC SIGNAL BOX WATER METER GAS VALVE IRRIGATION CONTROL VALVE AREA LIGHT LIGHT STANDARD COMMUNICATION MANHOLE ELECTRICAL MANHOLE GAS MANHOLE STORM DRAIN MANHOLE SANITARY SEWER MANHOLE TELEPHONE MANHOLE	CABLE TELEVISION BOX ELECTRICAL BOX GAS BOX STREET LIGHT BOX TELEPHONE BOX CABLE TELEVISION PEDESTAL BOLLARDS/SMALL POLE MONITORING WELL SANITARY SEWER CLEAN OUT STREET SIGN/SIGN POST FIBER OPTIC PLACARD GAS PLACARD MAIL BOX BRUSH LINE/DRP LINE
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RIGHT-OF-WAY CENTERLINE SANITARY SEWER WITH SIZE AND MATERIAL	WATER WITH SIZE AND MATERIAL STORM DRAIN FORCE MAIN WITH SIZE
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**ABBREVIATIONS**

AC ASPHALTIC CONCRETE	FD FLOOR DRAIN	PP POWER POLE
ARV AIR RELEASE VALVE	EMST. EXISTING	PRV PRESSURE RELIEF VALVE
AVV AIR VACUUM VALVE	FLG FLANGE	R/W RIGHT-OF-WAY
CAV CENTERLINE	FBEL&C FLOWLINE BONDED EPOXY LINED	RW RAW WATER
CAV CENTERLINE	FL FLOW LINE	SD STORM DRAIN
CM/BC COMBINATION AIR VALVE & COATED	FC FIBER OPTIC	SS SANITARY SEWER
D COATED	MJ MECHANICAL JOINT	STA STATION
D DRAIN	PC POINT ON CURVE	TS TANK SUCTIION
DM DIA. DIMETER	PE PLAN END	V VENT
DP DUCTILE IRON PIPE	PH POIHOLED UTILITY CROSSING	VW WATER
EL END OF CURVE	PI POINT OF INFLECTION	WW WELL WATER
EL ELEVATION	PL PROPERTY LINE	

**EROSION CONTROL NOTES**

- EROSION CONTROL DEVICES SHALL BE INSTALLED TO PREVENT ANY SILT OR DUST FROM LEAVING THE SITE. MEASURES INSTALLED SHALL CONFORM TO THOSE SPECIFIED AS "BEST MANAGEMENT PRACTICES" IN THE REGIONAL WATER QUALITY CONTROL BOARD'S EROSION AND SEDIMENT CONTROL FIELD MANUAL. IN THE EVENT THAT THE INSTALLED DEVICES FAIL, ADDITIONAL OR IMPROVED DEVICES SHALL BE PLACED IMMEDIATELY. EROSION SHALL BE CONTROLLED AT THE SOURCE. THE PROJECT PERIMETER SHALL BE PROTECTED WITH DE-SILTING DEVICES.
- PROJECT DRIVEWAYS AND CONSTRUCTION ENTRANCES SHALL BE PROTECTED AGAINST EROSION AND TRACKING OF MUD AND DEBRIS AT ALL TIMES, INCLUDING EVENINGS, WEEKENDS AND HOLIDAYS. SUCH PROTECTION MAY BE MODIFIED TO PROVIDE ACCESS TO THE WORK SITE DURING WORK HOURS.
- ALL STOCKPILES SHALL BE PROTECTED AGAINST WIND AND WATER EROSION. IMMEDIATELY UPON PLACEMENT, SUCH PROTECTION SHALL REMAIN IN PLACE UNTIL USE OR REMOVAL OF THE STOCKPILE, REGARDLESS OF THE TIME OF YEAR.
- ALL FRESH CUT AND FILL SLOPES SHALL BE IMMEDIATELY PROTECTED BY INSTALLATION OF EROSION CONTROL DEVICES, AND UNTIL PERMANENT EROSION CONTROL IS ESTABLISHED.
- PERMANENT EROSION CONTROL MEASURES SHALL BE FULLY ESTABLISHED TO THE SATISFACTION OF THE CITY REPRESENTATIVE. (TO BE COMPLETED NO LESS THAN 30 DAYS PRIOR TO REQUEST FOR FINAL APPROVAL.)
- DURING THE CONSTRUCTION PERIOD, THE PROJECT FRONTAGE(S) SHALL BE SWEEPED AND KEPT FREE OF DIRT, DUST AND DEBRIS.
- WASTE MATERIALS SHALL NOT BE WASHED OFFSITE. THIS INCLUDES BUT IS NOT LIMITED TO SOIL, PAINT, GROUT, COLOR COAT, CONCRETE DUST, SAW RESIDUES, GRINDINGS, AND OIL.
- THE CONTRACTOR IS RESPONSIBLE FOR THE PLACEMENT OF EROSION CONTROL DEVICES AS DIRECTED BY THE PROJECT WPCP OR THE CITY REPRESENTATIVE WHENEVER RAIN IS FORECAST.
- USE WATER TRUCKS OR SPRINKLER SYSTEMS IN SUFFICIENT QUANTITIES TO PREVENT AIRBORNE DUST FROM LEAVING THE CONSTRUCTION SITE. INCREASED WATERING FREQUENCY WILL BE REQUIRED WHENEVER WIND SPEEDS EXCEED 15 MPH.
- DESIGNATE A PERSON OR PERSONS TO MONITOR THE DUST CONTROL PROGRAM AND TO ORDER INCREASED WATERING, AS NECESSARY, TO PREVENT TRANSPORT OF PARTICULATE MATTER OFF SITE. THEIR DUTIES SHALL INCLUDE HOLIDAYS AND WEEKEND PERIODS WHEN WORK MAY NOT BE IN PROGRESS. THE NAME AND TELEPHONE NUMBER OF SUCH PERSONS SHALL BE PROVIDED TO THE APCD PRIOR TO CONSTRUCTION.
- ALL DISTURBED SOIL AREAS NOT SUBJECT TO REVEGETATION, INCLUDING SOIL STOCKPILES, SHALL BE STABILIZED USING APPROVED CHEMICAL SOIL BINDERS, JUTE NETTING OR OTHER METHODS APPROVED BY THE APCD WITH JURISDICTION.
- TRUCKS TRANSPORTING FILL MATERIAL TO AND FROM THE SITE SHALL BE TARPED OR MAINTAIN AT LEAST TWO FEET OF FREEBOARD.

AGENCY/UTILITY		
AGENCY	CONTACT	PHONE NUMBER
PUBLIC WORKS DIRECTOR / CITY ENGINEER	SHANNON SWEENEY	(805) 356-3810
FRONTIER COMMUNICATIONS	SANDRA O'KEEFE	(559) 992-6724
PG&E	LOUIS GARCIA	(805) 546-5263
SOUTHERN CALIFORNIA GAS COMPANY	JASON LEVMS	(805) 781-7939
CHARTER	JEFF DAVIS	(805) 783-4950
CALTRANS	MARSHALL ETRATA	(805) 903-3499
UNDERGROUND SERVICE ALERT		811

DESIGNED: JUR  
 DETAILED: JF  
 CHECKED: JF  
 APPROVED: JF  
 DATE: JUNE 2024

CITY OF GUADALUPE  
 PIONEER LIFT STATION AND FORCE MAIN PROJECT

NO. 05124

JOSEPH J. REDCHAITH



**NOTES, ABBREVIATIONS, AND LEGEND**

DESIGNED: JUR  
 DETAILED: JF  
 CHECKED: JF  
 APPROVED: JF  
 DATE: JUNE 2024

0 1 2 3  
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO FULL SCALE

PROJECT NO.

**G-002**  
**SHEET**  
 2 OF 16

DATE: 06/20/24 09:58:31 AM USER: jredchaith PROJECT: PIONEER LIFT STATION AND FORCE MAIN PROJECT SHEET: G-002 OF 16

**CALTRANS PERMIT:**  
0523-NUT-0121



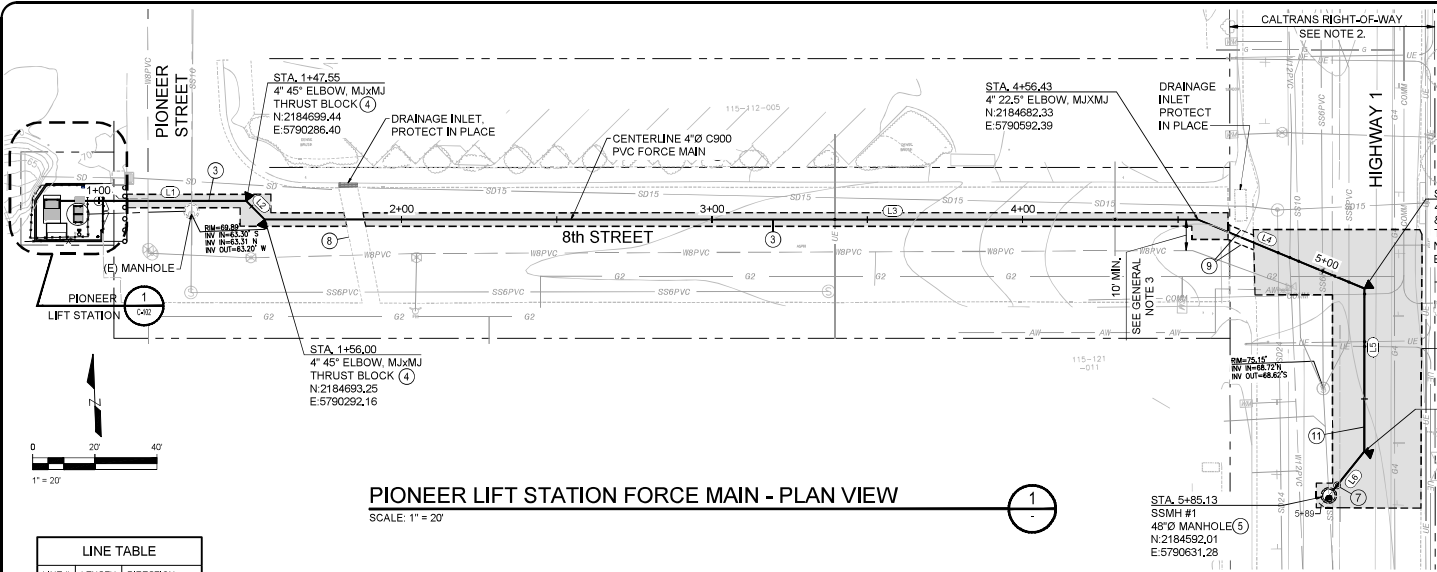
Know what's below.  
Call before you dig.

**CONSTRUCTION NOTES:**

- | TAG | DESCRIPTION   |
|-----|---|
| 1   | POT HOLE UTILITY CROSSING PER SPECIFICATION SECTION 020120, SUBMIT WRITTEN POT HOLE REPORT TO OWNER'S REPRESENTATIVE AND NOTIFY OWNER'S REPRESENTATIVE IF CONFLICTS ARE DISCOVERED. |
| 2   | PROTECT/SUPPORT EXISTING UTILITIES ACROSS TRENCH, SEE DETAIL.   |
| 3   | 4" Ø C900 (DR-14) PVC FORCE MAIN PER SPECIFICATION SECTION 402092 AND DETAIL.   |
| 4   | PROVIDE THRUST BLOCKS PER DETAIL.   |
| 5   | MANHOLE PER DETAIL. COAT MANHOLE PER SPECIFICATION SECTION 099720.  |
| 6   | INLINE PRESSURE CLEANOUT PER DETAIL.  |
| 7   | TRACER WIRE ACCESS VAULT PER DETAIL.  |
| 8   | CONTRACTOR TO REMOVE AND REPLACE CROSS GUTTER PER DETAIL.   |
| 9   | SAW CUT AT CROSS GUTTER EXPANSION JOINT, REPAIR CROSS GUTTER PER DETAIL.  |
| 10  | PAVEMENT RESTORATION PER DETAIL.  |
| 11  | 4" Ø C900 (DR-14) PVC FORCE MAIN PER SPECIFICATION SECTION 402092, TRENCH BACKFILL WITH IN CALTRANS ROW PER DETAIL.   |

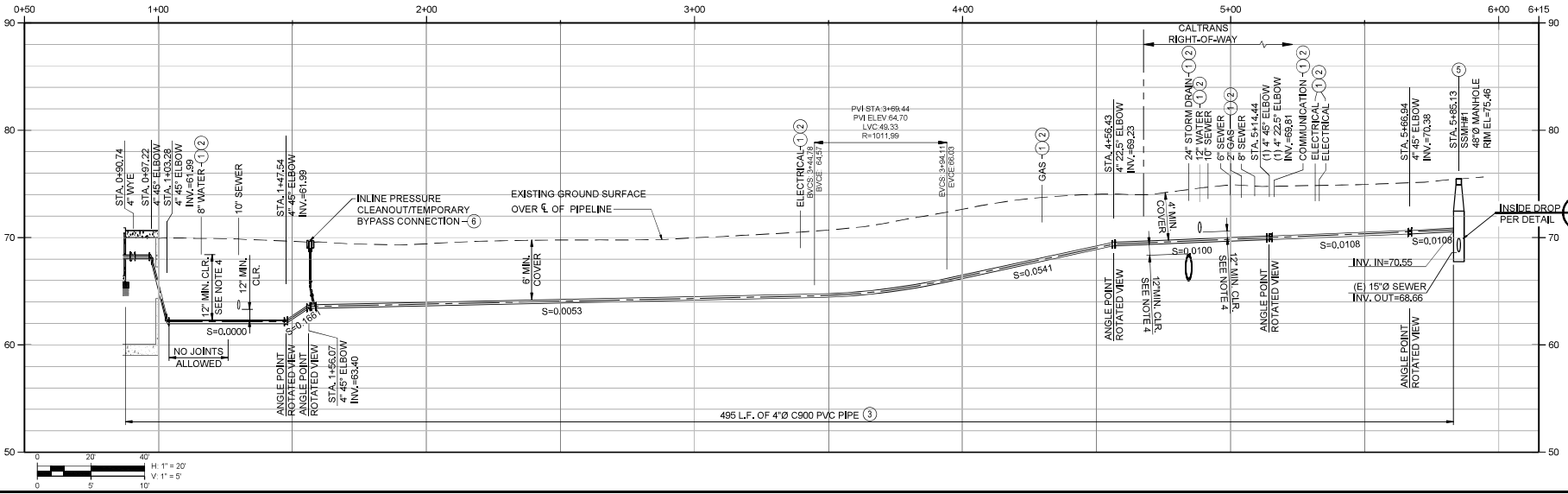
**GENERAL NOTES:**

- CONTRACTOR TO PROVIDE TRAFFIC CONTROL PLAN PER SPECIFICATION SECTION 015526 AND CALTRANS STANDARDS.
- CONTRACTOR TO COMPLY WITH REQUIREMENTS OF CALTRANS ENCROACHMENT PERMIT.
- CLEARANCE PER DIVISION OF DRINKING WATER.
- PAVEMENT RESTORATION SHALL BE PER SPECIFICATION SECTION 321216. LIMITS OF PAVING TO EXTEND TO CENTERLINE OF HIGHWAY. NO PARALLEL PAVEMENT JOINTS ALLOWED WITHIN TRAVEL LANE AND BIKE LANE OF HIGHWAY.



**PIONEER LIFT STATION FORCE MAIN - PLAN VIEW**  
SCALE: 1" = 20'

LINE #	LENGTH	DIRECTION
L1	47.55	S87° 54' 56.83"E
L2	8.45	S42° 54' 56.85"E
L3	303.43	S87° 54' 56.83"E
L4	58.01	S65° 24' 56.84"E
L5	52.50	S2° 05' 31.41"W
L6	16.19	S41° 03' 07.96"W



495 LF. OF 4" Ø C900 PVC PIPE (3)

CITY OF CHADARA LIFE  
PIONEER LIFT STATION AND FORCE MAIN PROJECT  
PIONEER LIFT STATION FORCE MAIN  
PLAN AND PROFILE

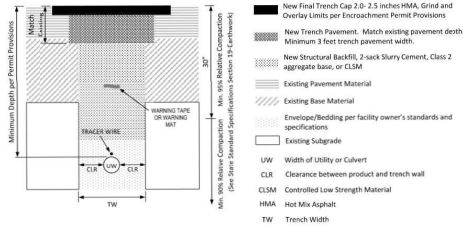
DESIGNED: JWR  
CHECKED: JWP  
APPROVED:  
DATE: JUNE 2024

IF THIS BAR DOES NOT MATCH THE DRAWING, PLEASE CONTACT THE ENGINEER FOR A CORRECTED SCALE.

PROJECT NO.  
**C-104**  
SHEET  
7 OF 16

DATE: 6/10/2024 10:48:00 AM PROJECT: PIONEER LIFT STATION AND FORCE MAIN PROJECT DRAWN BY: JWP CHECKED BY: JWP APPROVED BY: JWP DATE: 6/10/2024 10:48:00 AM

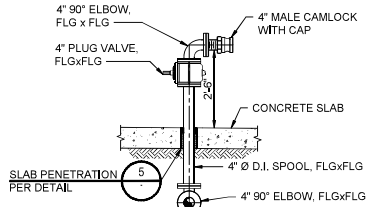
**TYPICAL TRENCH DETAIL**



1. Must include tracer wire or other continuous measure to provide positive subsurface detection for the life of the facility
2. Open trench installation of underground utility facilities must include warning tape or warning mats complying with the American Public Works Association (APWA) Uniform Color Code for identifying the type of underground utility. Where mechanical protection is installed, warning tape must be placed above the mechanical protection and below the roadbed subgrade as shown on the details. For all other backfills, warning tape or warning mat shall be placed half-way between the utility and the finished grade.
3. When the LW is 5' or less than the minimum CLR shall be 6"
4. New structural backfill shall consist of either 2-lack slurry cement, Class 2 aggregate base, or CLSM. When TW is < 24 inches, Class 2 aggregate base is not recommended for backfill
5. Structures backfill shall conform to Section 19-3.02C and 3.03 of the Standard Specifications
6. Slurry cement backfill shall conform to Section 19-3.02E of the State Standard Specifications
7. Aggregate base and its compaction shall conform to Section 26 of the State Standard Specifications
8. CLSM if used must conform to Section 19-3.02G of the Standard Specifications. When CLSM is utilized the mix design and test results must be submitted to the State's representative. See Appendix 1 of the Encroachment Permits Manual for additional information.
9. Hot Mix Asphalt (HMA) is used to backfill Asphalt Concrete (AC) Section of the road. HMA must conform to Section 39-2 of the State Standard Specifications
10. AC used to replace pavement section shall match existing pavement depth, unless directed otherwise by the State's representative.
11. A tack coat of asphaltic emulsion conforming to Section 29-2.02C (1) (f) shall be provided and applied.
12. When the trench is within 4 feet of curb and gutter, additional cold planning may be required at the discretion of the State's representative. Potholes or trenches separated / adjoined by 10 feet or less to be overlaid together at the discretion of the State's representative.
13. Pavement markings and/or striping removed or damaged during construction must be replaced in kind as directed by the State's representative.
14. If trench is in Portland Cement Concrete (PCC) roadway, remove the concrete to a depth of at least 3 feet below finished grade as per standard Specification 15.03B. Replace entire concrete slab from joint to joint as directed by State's representative.
15. Electrical systems installations that are part of State Highway System must be installed in compliance with Caltrans Standard Specifications, Section 87.
16. All methods of compaction shall be by mechanical means. Ponding, jetting, or flooding shall not be allowed. Compaction shall conform to Section 15.5 of the State Standard Specifications
17. Cold planning to accommodate the placement of steel plates is required for posted speed limits 45 MPH or greater. State representative may request cold planning for steel plates to meet field conditions even if the posted speed is less than 45 MPH

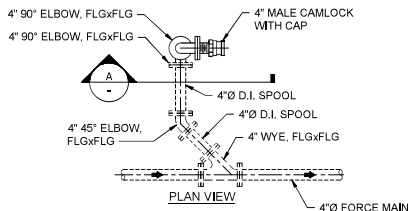
**ENCROACHMENT PERMIT TRENCH DETAIL**

NOT TO SCALE



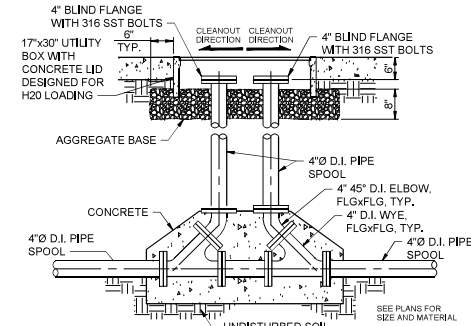
**BYPASS CONNECTION SECTION**

NOT TO SCALE

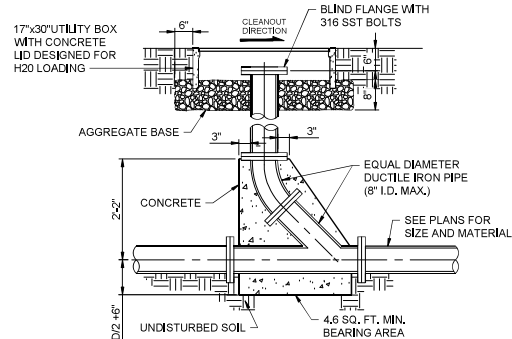


**BYPASS CONNECTION**

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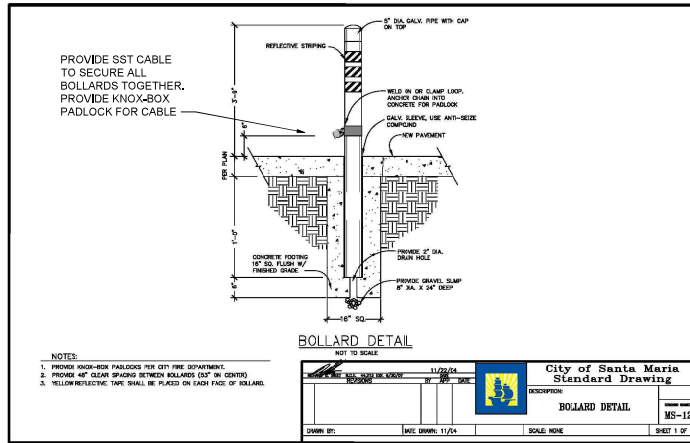


**IN LINE 2-WAY PRESSURE CLEANOUT**



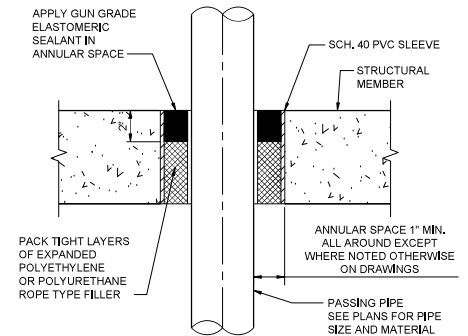
**IN LINE PRESSURE CLEANOUT**

NOT TO SCALE



**REMOVABLE BOLLARD DETAIL**

NOT TO SCALE



**SLAB PENETRATION**

NOT TO SCALE



**CALTRANS PERMIT:**  
**0523-NUT-0121**

DATE	11/22/24
DESIGNED BY	JUR
CHECKED BY	JSP
APPROVED BY	JUR
DATE	JUNE 2024
PROJECT NO.	0523-NUT-0121
DESCRIPTION	CALTRANS ENCROACHMENT PERMIT
CONTRACT NUMBER	0523-NUT-0121
PROJECT NUMBER	0523-NUT-0121
PREPARED BY	JOSEPH J. RECHMUTH
DATE	08/15/2023



**mkn**  
 P.O. BOX 1004  
 ANAHEIM TO GRANITE, CA 92821



CITY OF SANTA MARÍA  
 PIONEER LIFT STATION AND FORCE MAIN PROJECT

CIVIL DETAILS - 3

DESIGNED BY	JUR
DATE	JUNE 2024
CHECKED BY	JSP
APPROVED BY	JUR
DATE	JUNE 2024
PROJECT NO.	0523-NUT-0121
DESCRIPTION	CALTRANS ENCROACHMENT PERMIT
CONTRACT NUMBER	0523-NUT-0121
PROJECT NUMBER	0523-NUT-0121
PREPARED BY	JOSEPH J. RECHMUTH
DATE	08/15/2023

**C-503**  
**SHEET**  
**10 OF 16**

## ENCROACHMENT PERMIT GENERAL PROVISIONS

TR-0045 (REV. 12/2022)

1. **AUTHORITY:** The California Department of Transportation (“Department”) has authority to issue encroachment permits under Division 1, Chapter 3, Article 1, Sections 660 through 734 of the Streets and Highways Code.
2. **REVOCACTION:** Encroachment permits are revocable on five (5) business days’ notice unless otherwise stated on the permit or otherwise provided by law, and except as provided by law for public corporations, franchise holders, and utilities. Notwithstanding the foregoing, in an emergency situation as determined by the Department, an encroachment permit may be revoked immediately. These General Provisions and any applicable Special Provisions are subject to modification or abrogation by the Department at any time. Permittees’ joint use agreements, franchise rights, reserved rights or any other agreements for operating purposes in State of California (“State”) highway right-of-way may be exceptions to this revocation.
3. **DENIAL FOR NONPAYMENT OF FEES:** Failure to pay encroachment permit fees when due may result in rejection of future applications, denial of encroachment permits, and revocation of the encroachment permit if already issued.
4. **PERMITTEE AUTHORIZATION FOR OTHERS TO PERFORM WORK:** This encroachment permit allows only the Permittee and/or Permittee’s authorized contractor or agent to work within or encroach upon the State highway right-of-way, and the Permittee may not assign or transfer this encroachment permit. Any attempt to assign or transfer this encroachment permit shall be null and void. Permittee shall provide to the Department a list of Permittee’s authorized contractors/agents, in the form and at the time specified by the Department but if no time is specified then no later than the pre-construction meeting. Permittee shall keep the list current and shall provide updates to the Department immediately upon any change to the list of authorized contractors/agents, including but not limited the addition, removal, or substitution of an authorized contractor/agent, or a new address or contact information for an existing authorized contractor/agent. Permittee is responsible for the acts and/or omissions of any person or entity acting on behalf of the Permittee, even if such person or entity is not included on Permittee’s list of authorized contractors and/or agents.
5. **ACCEPTANCE OF PROVISIONS:** Permittee, and the Permittee’s authorized contractors and/or agents, understand and agree to accept and comply with these General Provisions, the Special Provisions, any and all terms and/or conditions contained in or incorporated into the encroachment permit, and all attachments to the encroachment permit (collectively “the Permit Conditions”), for any encroachment, work, and/or activity to be performed under this encroachment permit and/or under color of authority of this encroachment permit. Permittee understands and agrees the Permit Conditions are applicable to and enforceable against Permittee as long as the encroachment remains in, under, or over any part of the State highway right-of-way. The Permittee’s authorized contractors and/or agents, are also bound by the Permit Conditions. Non-compliance with the Permit Conditions by the Permittee’s authorized contractor and/or agent will be deemed non-compliance by the Permittee.
6. **BEGINNING OF WORK:** When traffic is not impacted (see General Provision Number 35), the Permittee must notify the Department’s representative two (2) business days before starting permitted work. Permittee must notify the Department’s representative if the work is to be interrupted for a period of five (5) business days or more, unless otherwise agreed upon. All work must be performed on weekdays during regular work hours, excluding holidays, unless otherwise specified in this encroachment permit.
7. **STANDARDS OF CONSTRUCTION:** All work performed within State highway right-of-way must conform to all applicable Departmental construction standards including but not limited to: Standard Specifications, Standard Plans, Project Development Procedures Manual, Highway Design Manual and Special Provisions.  
Other than as expressly provided by these General Provisions, the Special Provisions, the Standard Specifications, Standard Plans, and other applicable Departmental standards, nothing in these General Provisions is intended to give any third party any legal or equitable right, remedy, or claim with respect to the encroachment permit and/or to these General Provisions or any provision herein. These General Provisions are for the sole and exclusive benefit of the Permittee and the Department.  
Where reference is made in such standards to “Contractor” and “Engineer,” these are amended to be read as “Permittee” and “Department’s representative,” respectively, for purposes of this encroachment permit.
8. **PLAN CHANGES:** Deviations from plans, specifications, and/or the Permit Conditions as defined in General Provision Number 5 are not allowed without prior approval from the Department’s representative and the Federal Highway Administration (“FHWA”) representative if applicable.
9. **RIGHT OF ENTRY, INSPECTION AND APPROVAL:** All work is subject to monitoring and inspection. The United States, the State, the Department, and the Directors, officers, employees, agents, and/or contractors of the State and/or of the Department, and other state, and federal agencies, and the FHWA, through their agents or representatives, must have full access to highway



**ENCROACHMENT PERMIT GENERAL PROVISIONS**

facilities/encroachment area, at any and all times for the purpose of inspection, maintenance, activities needed for construction/reconstruction, and operation of the State highway right-of-way.

Upon completion of work, Permittee must request a final inspection for acceptance and approval by the Department. The local public agency Permittee must not give final construction approval to its contractor until final acceptance and approval by the Department is obtained.

- 10. PERMIT AT WORKSITE:** Permittee and Permittee's authorized contractors/agents must keep the permit package and current list of authorized contractors/agents, or copies thereof, at the work site at all times and must show such documents upon request to any Department representative or law enforcement officer. If the permit package or current list of authorized contractors/agents, or copies thereof, are not kept and made available at the work site at all times, then all work must be suspended.
- 11. CONFLICTING ENCROACHMENTS:** Permittee must yield start of work to ongoing, prior authorized work adjacent to or within the limits of the Permittee's project site. When existing encroachments conflict with Permittee's work, the Permittee must bear all cost for rearrangements (e.g., relocation, alteration, removal, etc.).
- 12. PERMITS, APPROVALS, AND CONCURRENCES FROM OTHER AGENCIES AND/OR ENTITIES:** This encroachment permit is invalidated if the Permittee has not obtained all permits, approvals, and concurrences necessary and required by law, including but not limited to those from the California Public Utilities Commission ("CPUC"), California Occupational Safety and Health Administration ("Cal-OSHA"), local and state and federal environmental agencies, the California Coastal Commission, and any other public agency and/or entity having jurisdiction. Permittee is responsible for providing notice of the encroachment to, and obtaining concurrence from, any person or entity (whether public or private) affected by the scope of work described in the encroachment permit, regardless of whether such notice or concurrence is required by law; the Department is not responsible to provide such notice or obtain such concurrence. Permittee warrants all such permits, approvals, and concurrences have been obtained before beginning work under this encroachment permit. The Department may, at the Department's discretion, require the Permittee to demonstrate that Permittee has obtained all such permits, approvals, and concurrences, and Permittee shall demonstrate this at the time and in the manner specified by the Department.
- 13. PEDESTRIAN AND BICYCLIST SAFETY:** A safe continuous passageway must be maintained through the work area at existing pedestrian or bicycle facilities. At no time must pedestrians be diverted onto a portion of the street used for vehicular traffic. At locations where safe alternate passageways cannot be provided, appropriate signs and barricades must be installed at the limits of construction and in advance of the limits of construction at the nearest crosswalk or intersection to detour

pedestrians to facilities across the street. Attention is directed to Section 7-1.04 "Public Safety," and to Section 12-4.04 "Temporary Pedestrian Access Routes," and to Section 16-2.02 "Temporary Pedestrian Facility," of the Department's Standard Specifications, and to California Vehicle Code section 21760, subdivision (c).

- 14. PUBLIC TRAFFIC CONTROL:** The Permittee must provide traffic control protection, warning signs, lights, safety devices, etc., and take all other measures necessary for the traveling public's safety as required by law and/or the Department. While providing traffic control, the needs of all road users, including but not limited to motorists, bicyclists and pedestrians, including persons with disabilities in accordance with the Americans with Disabilities Act, must be an essential part of the work activity.
- Lane, Bike Lane, Sidewalk, Crosswalk, and/or shoulder closures must comply with the Department's Standard Specifications and Standard Plans for Temporary Traffic Control Systems & Temporary Pedestrian Access Routes, and with the applicable Special Provisions. Where issues are not addressed in the Standard Specifications, Standard Plans, and/or Special Provisions, the California Manual on Uniform Traffic Control Devices (Part 6, Temporary Traffic Control) must be followed.
- 15. MINIMUM INTERFERENCE WITH TRAFFIC:** Permittee must plan and conduct work so as to create the least possible inconvenience to the traveling public (motorized vehicles, unmotorized vehicles such as bicycles, pedestrians, person(s) with disabilities, etc.), such that traffic is not unreasonably delayed.
- 16. STORAGE OF EQUIPMENT AND MATERIALS:** The storage of equipment or materials is not allowed within State highway right-of-way, unless specified within the Special Provisions of this encroachment permit. If encroachment permit Special Provisions allow for the storage of equipment or materials within the State highway right-of-way, the equipment and material storage must also comply with Section 7-1.04, Public Safety, of the Department's Standard Specifications.
- 17. CARE OF DRAINAGE:** Permittee must provide alternate drainage for any work interfering with an existing drainage facility in compliance with the Department's Standard Specifications, Standard Plans, and/or as directed by the Department's representative.
- 18. RESTORATION AND REPAIRS IN STATE HIGHWAY RIGHT-OF-WAY:** Permittee is responsible for restoration and repair of State highway right-of-way resulting from permitted work (Streets and Highways Code, section 670 et seq.).
- 19. STATE HIGHWAY RIGHT-OF-WAY CLEAN UP:** Upon completion of work, Permittee must remove and dispose of all scraps, refuse, brush, timber, materials, etc. off the State highway right-of-way. The aesthetics of the highway must be as it was before work started or better.
- 20. COST OF WORK:** Unless stated otherwise in the encroachment permit or a separate written agreement with the Department, the Permittee must bear all costs

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- incurred for work within the State highway right-of-way and waives all claims for indemnification or contribution from the United States, the State, the Department, and from the Directors, officers, and employees of the State and/or the Department. Removal of Permittee's personal property and improvements shall be at no cost to the United States, the State, and the Department.
21. **ACTUAL COST BILLING:** When specified in the permit, the Department will bill the Permittee actual costs at the currently set Standard Hourly Rate for encroachment permits.
22. **AS-BUILT PLANS:** When required, Permittee must submit one (1) set of folded as-built plans within thirty (30) calendar days after completion and acceptance of work in compliance with requirements listed as follows:
- a) Upon completion of the work provided herein, the Permittee must submit a paper set of As-Built plans to the Department's representative.
  - b) All changes in the work will be shown on the plans, as issued with the permit, including changes approved by Encroachment Permit Rider.
  - c) The plans are to be prominently stamped or otherwise noted "AS-BUILT" by the Permittee's representative who was responsible for overseeing the work. Any original plan that was approved with a Department stamp, or by signature of the Department's representative, must be used for producing the As-Built plans.
  - d) If construction plans include signing or striping, the dates of signing or striping removal, relocation, or installation must be shown on the As-Built plans when required as a condition of the encroachment permit. When the construction plans show signing and striping for staged construction on separate sheets, the sheet for each stage must show the removal, relocation, and installation dates of the appropriate staged striping and signing.
  - e) As-Built plans must contain the Encroachment Permit Number, County, Route, and Post Mile on each sheet.
  - f) The As-Built Plans must not include a disclaimer statement of any kind that differs from the obligations and protections provided by sections 6735 through 6735.6 of the California Business and Professions Code. Such statements constitute non-compliance with Encroachment Permit requirements and may result in the Department retaining Performance Bonds or deposits until proper plans are submitted. Failure to comply may also result in denial of future encroachment permits or a provision requiring a public agency to supply additional bonding.
23. **PERMITS FOR RECORD PURPOSES ONLY:** When work in the State highway right-of-way is within an area under a Joint Use Agreement (JUA) or a Consent to Common Use Agreement (CCUA), a fee exempt encroachment permit is issued to the Permittee for the purpose of providing a notice and record of work. The Permittee's prior rights must be preserved without the intention of creating new or different rights or obligations.
- "Notice and Record Purposes Only" must be stamped across the face of the encroachment permit.
24. **BONDING:** The Permittee must file bond(s), in advance, in the amount(s) set by the Department and using forms acceptable to the Department. The bonds must name the Department as obligee. Failure to maintain bond(s) in full force and effect will result in the Department stopping all work under this encroachment permit and possibly revoking other encroachment permit(s). Bonds are not required of public corporations or privately-owned utilities unless Permittee failed to comply with the provisions and/or conditions of a prior encroachment permit. The surety company is responsible for any latent defects as provided in California Code of Civil Procedure section 337.15. A local public agency Permittee also must comply with the following requirements:
- a) In recognition that project construction work done on State property will not be directly funded and paid by State, for the purpose of protecting stop notice claimants and the interests of State relative to successful project completion, the local public agency Permittee agrees to require the construction contractor to furnish both a payment and performance bond in the local public agency's name with both bonds complying with the requirements set forth in Section 3-1.05 Contract Bonds of the Department's Standard Specifications before performing any project construction work.
  - b) The local public agency Permittee must defend, indemnify, and hold harmless the United States, the State and the Department, and the Directors, officers, and employees of the State and/or Department, from all project construction related claims by contractors, subcontractors, and suppliers, and from all stop notice and/or mechanic's lien claimants. The local public agency also agrees to remedy, in a timely manner and to the Department's satisfaction, any latent defects occurring as a result of the project construction work.
25. **FUTURE MOVING OF INSTALLATIONS:** Permittee understands and agrees to relocate a permitted installation upon notice by the Department. Unless under prior property right or agreement, the Permittee must comply with said notice at the Permittee's sole expense.
26. **ENVIRONMENTAL:**
- a) **ARCHAEOLOGICAL/HISTORICAL:** If any archaeological or historical resources are identified or encountered in the work vicinity, the Permittee must immediately stop work, notify the Department's representative, retain a qualified archaeologist who must evaluate the site at Permittee's sole expense, and make recommendations to the Department's representative regarding the continuance of work.
  - b) **HAZARDOUS MATERIALS:** If any hazardous waste or materials (such as underground storage tanks, asbestos pipes, contaminated soil, etc.) are identified or encountered in the work vicinity, the Permittee must immediately stop work, notify the Department's representative, retain a qualified hazardous

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waste/material specialist who must evaluate the site at the Permittee's sole expense, and make recommendations to the Department's representative regarding the continuance of work.

Attention is directed to potential aerially deposited lead (ADL) presence in unpaved areas along highways. It is the Permittee's responsibility to take all appropriate measures to protect workers in conformance with California Code of Regulations Title 8, Section 1532.1, "Lead," and with Cal-OSHA Construction Safety Orders, and to ensure roadway soil management is in compliance with Department of Toxic Substances Control (DTSC) requirements.

- c) **BIOLOGICAL:** If any regional, state, or federally listed biological resource is identified or encountered in the work vicinity, the Permittee must immediately stop work, notify the Department's representative, retain a qualified biologist who must evaluate the site at Permittee's sole expense, and make recommendations to the Department's representative regarding the continuance of work.

27. **PREVAILING WAGES:** Work performed by or under an encroachment permit may require Permittee's contractors and subcontractors to pay appropriate prevailing wages as set by the California Department of Industrial Relations. Inquiries or requests for interpretations relative to enforcement of prevailing wage requirements must be directed to the California Department of Industrial Relations.

28. **LIABILITY, DEFENSE, AND INDEMNITY:** The Permittee agrees to indemnify and save harmless the United States, the State, the Department, and the Directors, officers, employees, agents and/or contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, from any and all claims, demands, damages, costs, liability, suits, or actions of every name, kind, and description, including but not limited to those brought for or on account of property damage, invasion of privacy, violation or deprivation of a right under a state or federal law, environmental damage or penalty, or injury to or death of any person including but not limited to members of the public, the Permittee, persons employed by the Permittee, and/or persons acting on behalf of the Permittee, arising out of or in connection with: (a) the issuance and/or use of this encroachment permit; and/or (b) the encroachment, work, and/or activity conducted pursuant to this encroachment permit, or under color of authority of this encroachment permit but not in full compliance with the Permit Conditions as defined in General Provision Number 5 ("Unauthorized Work or Activity"); and/or (c) the installation, placement, design, existence, operation, and/or maintenance of the encroachment, work, and/or activity; and/or (d) the failure by the Permittee, or by anyone acting for or on behalf of the Permittee, to perform the Permittee's obligations under any part of the Permit Conditions as defined in General Provision Number 5, in respect to maintenance or any other obligation; and/or (e) any change to the Department's property or adjacent

property, including but not limited to the features or conditions of either of them, made by the Permittee or anyone acting on behalf of the Permittee; and/or (f) a defect or obstruction related to or caused by the encroachment, work, and/or activity whether conducted in compliance with the Permit Conditions as defined in General Provision Number 5 or constituting Unauthorized Work or Activity, or from any cause whatsoever. The duty of the Permittee to indemnify and save harmless includes the duties to defend as set forth in Section 2778 of the Civil Code.

It is the intent of the Department and the Permittee that except as prohibited by law, the Permittee will defend, indemnify, and hold harmless as set forth in this General Provision Number 28 regardless of the existence or degree of fault or negligence, whether active or passive, primary or secondary, on the part of: the United States, the State; the Department; the Directors, officers, employees, agents and/or contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors; the Permittee; persons employed by the Permittee; and/or persons acting on behalf of the Permittee.

The Permittee waives any and all rights to any type of expressed or implied indemnity from or against the United States, the State, the Department, and the Directors, officers, employees, agents, and/or contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors.

The Permittee understands and agrees to comply with the obligations of Titles II and III of the Americans with Disabilities Act in the conduct of the encroachment, work, and/or activity whether conducted pursuant to this encroachment permit or constituting Unauthorized Work or Activity, and further agrees to defend, indemnify, and save harmless the United States, the State, the Department, and the Directors, officers, employees, agents, and/or contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, from any and all claims, demands, damages, costs, penalties, liability, suits, or actions of every name, kind, and description arising out of or by virtue of the Americans with Disabilities Act.

The Permittee understands and agrees the Directors, officers, employees, agents, and/or contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, are not personally responsible for any liability arising from or by virtue of this encroachment permit.

For the purpose of this General Provision Number 28 and all paragraphs herein, "contractors of the State and/or of the Department" includes contractors, and their subcontractors, under contract to the State and/or the Department.

This General Provision Number 28 and all paragraphs herein take effect immediately upon issuance of this encroachment permit, and apply before, during, and after the encroachment, work, and/or activity



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contemplated under this encroachment permit, whether such work is in compliance with the Permit Conditions as defined in General Provision Number 5 or constitutes Unauthorized Work or Activity, except as otherwise provided by California law. The Permittee's obligations to defend, indemnify, and save harmless under this General Provision Number 28 take effect immediately upon issuance of this encroachment permit and have no expiration date, including but not limited to situations in which this encroachment permit expires or is revoked, the work or activity performed under this encroachment permit is accepted or not accepted by the Department, the encroachment, work, and/or activity is conducted in compliance with the Permit Conditions as defined in General Provision Number 5 or constitutes Unauthorized Work or Activity, and/or no work or activity is undertaken by the Permittee or by others on the Permittee's behalf.

If the United States or an agency, department, or board of the United States is the Permittee, the first two paragraphs of this General Provision Number 28 (beginning "The Permittee agrees to indemnify..." and "It is the intent of the parties...") are replaced by the following paragraph:

Claims for personal injury, death, or property damage allegedly caused by the negligent or wrongful act or omission of any employee of the United States acting within the scope of their official duties are subject to the Federal Tort Claims Act, as amended, 28 U.S.C. § 1346 and § 2671 et seq. (Chapter 171).

29. **NO PRECEDENT ESTABLISHED:** This encroachment permit is issued with the understanding that it does not establish a precedent.

30. **FEDERAL CIVIL RIGHTS REQUIREMENTS FOR PUBLIC ACCOMMODATION:**

a) As part of the consideration for being issued this encroachment permit, the Permittee, on behalf of Permittee and on behalf of Permittee's personal representatives, successors in interest, and assigns, does hereby covenant and agree that:

i) No person on the grounds of race, color, or national origin may be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination in the use of said facilities.

ii) That in connection with the construction of any improvements on said lands and the furnishings of services thereon, no discrimination must be practiced in the selection and retention of first-tier subcontractors in the selection of second-tier subcontractors.

iii) That such discrimination must not be practiced against the public in their access to and use of the facilities and services provided for public accommodations (such as eating, sleeping, rest, recreation), and operation on, over, or under the space of the State highway right-of-way.

iv) That the Permittee must use the premises in compliance with all other requirements imposed pursuant to Title 15, Code of Federal

Regulations, Commerce and Foreign Trade, Subtitle A. Office of the Secretary of Commerce, Part 8 (15 C.F.R. Part 8) and as said Regulations may be amended.

b) That in the event of breach of any of the above nondiscrimination covenants, the State and the Department have the right to terminate this encroachment permit and to re-enter and repossess said land and the facilities thereon and hold the same as if said permit had never been made or issued.

31. **MAINTENANCE:** The Permittee is responsible at Permittee's sole expense for the encroachment, and the inspection, maintenance, repair, and condition thereof, and is responsible to ensure the encroachment does not negatively impact State highway safety, maintenance, operations, construction, State facilities, activities related to construction/reconstruction, or other encroachments. The Permittee's obligations in the preceding sentence take effect immediately upon issuance of this encroachment permit and continue until the encroachment is entirely and permanently removed. Additional encroachment permits or approval documents may be required authorizing work related to inspection, repair, and/or maintenance activities. Contact the Department for information.

32. **SPECIAL EVENTS:** In accordance with subdivision (a) of Streets and Highways Code section 682.5 and 682.7, the Department is not responsible for the conduct or operation of the permitted activity, and the applicant agrees to defend, indemnify, and hold harmless the United States, the State, the Department, and the Directors, officers, employees, agents, and contractors of the State and/or of the Department, including but not limited to the Director of Transportation and the Deputy Directors, from any and all claims, demands, damages, costs, liability, suits, or actions of every name, kind and description arising out of any activity for which this encroachment permit is issued.

The Permittee is required, as a condition of this encroachment permit, for any event that awards prize compensation to competitors in gendered categories, for any participant level that receives prize compensation, to ensure the prize compensation for each gendered category is identical at each participant level. (Streets and Highways Code, section 682.7.)

The Permittee understands and agrees to comply with the obligations of Titles II and III of the Americans with Disabilities Act in the conduct of the event, and further agrees to defend, indemnify, and save harmless the United State, the State and the Department, and the Directors, officers, and employees of the State and/or Department, including but not limited to the Director of the Department and the Deputy Directors, from any and all claims, demands, damages, costs, liability, suits, or actions of every name, kind and description arising out of or by virtue of the Americans with Disabilities Act.

33. **PRIVATE USE OF STATE HIGHWAY RIGHT-OF-WAY:** State highway right-of-way must not be used for private purposes without compensation to the State. The gifting

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of public property uses and therefore public funds is prohibited under the California Constitution, Article XVI, Section 6.

34. **FIELD WORK REIMBURSEMENT:** Permittee must reimburse the Department for field work performed by or on behalf of the Department to correct or remedy issues created by the Permittee or by others acting on behalf of the Permittee, including but not limited to hazards or damaged facilities, or to clear refuse, debris, etc. not attended to by the Permittee or by others acting on behalf of the Permittee.
35. **LANE CLOSURE REQUEST SUBMITTALS AND NOTIFICATION OF CLOSURES TO THE DEPARTMENT:** Lane closure request submittals and notifications must be in accordance with Section 12-4.02, and Section 12.4-04, of the Department's Standard Specifications or as directed by the Department's representative. The Permittee must notify the Department's representative and the Traffic Management Center ("TMC") before initiating a lane closure or conducting an activity that may cause a traffic impact. In emergency situations when the corrective work or the emergency itself may affect traffic, the Department's representative and the TMC must be notified as soon as possible.
36. **SUSPENSION OF TRAFFIC CONTROL OPERATION:** The Permittee, upon notification by the Department's representative, must immediately suspend all traffic lane, bike lane, sidewalk, crosswalk, and/or shoulder closure operations and any operation that impedes the flow of traffic. All costs associated with this suspension must be borne by the Permittee.
37. **UNDERGROUND SERVICE ALERT (USA) NOTIFICATION:** Any excavation requires compliance with the provisions of Government Code section 4216 et seq., including but not limited to notice to a regional notification center, such as Underground Service Alert (USA). The Permittee must provide notification to the Department representative at least five (5) business days before, and the regional notification center at least forty-eight (48) hours before, performing any excavation work within the State highway right-of-way.
38. **COMPLIANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA):** All work within the State highway right-of-way to construct and/or maintain any public facility must be designed, maintained, and constructed strictly in accordance with all applicable Federal Access laws and regulations (including but not limited to Section 504 of the Rehabilitation Act of 1973, codified at 29 U.S.C. § 794), California Access laws and regulations relating to ADA, along with its implementing regulations, Title 28 of the Code of Federal Regulations Parts 35 and 36 (28 C.F.R., Ch. I, Part 35, § 35.101 et seq., and Part 36, § 36.101 et seq.), Title 36 of the Code of Federal Regulations Part 1191 (36 C.F.R., Ch. XI, Part 1191, § 1119.1 et seq.), Title 49 of the Code of Federal Regulations Part 37 (49 C.F.R., Ch. A, Part 37, § 37.1 et seq.), the United States Department of Justice Title II and Title III for the ADA, and California Government Code section 4450 et seq., which require public facilities be made accessible to persons with disabilities.
- Notwithstanding the requirements of the previous paragraph, all construction, design, and maintenance of public facilities must also comply with the Department's Design Information Bulletin 82, "Pedestrian Accessibility Guidelines for Highway Projects" and Standard Plans & Specifications on "Temporary Pedestrian Access Routes."
39. **STORMWATER:** The Permittee is responsible for full compliance with the following:
- For all projects, the Department's Storm Water Program and the Department's National Pollutant Discharge Elimination System (NPDES) Permit requirements under Order No. 2012-0011-DWQ, NPDES No CAS000003; and
  - In addition, for projects disturbing one acre or more of soil, with the California Construction General Permit Order No. 2009-0009-DWQ, NPDES No CAS000002; and
  - In addition, for projects disturbing one acre or more of soil in the Lahontan Region with Order No. R6T-2016-0010, NPDES No CAG616002.
  - For all projects, it is the Permittee's responsibility to install, inspect, repair, and maintain all facilities and devices used for water pollution control practices (Best Management Practices/BMPs) before performing daily work activities.

## UTILITY UNDERGROUND PROVISIONS (UG)

TR-0163 (Rev. 07/2023)

In addition to the attached Encroachment Permit General Provisions (TR-0045), the following special provisions are also applicable:

High priority utilities, pressurized facilities, pipes or ducts six (6) inches or larger in diameter, or placement of multiple pipes or ducts regardless of diameters are required to be encased on both conventional and access-controlled State highway right-of-way. An exception to this encasement policy may be allowed on a case-by-case basis with the “Uncased High-Pressure Natural Gas Pipeline” Special Provisions (TR-0158).

A “High Priority Utility” is defined as: 1) natural gas pipelines greater than six (6) inches in diameter, or with normal operating pressures greater than sixty (60) psig; 2) petroleum pipelines; 3) pressurized sanitary sewer pipelines; 4) high-voltage electric supply lines, conductors, or cables that have a potential to ground of greater than or equal to sixty (60) kV; or 5) hazardous materials pipelines that are potentially harmful to workers or the public if damaged.

The pavement or roadway must not be open cut unless specifically allowed. Utility installations are not allowed inside culverts or drainage structures.

All installations must comply with Chapter 17 of the Caltrans Project Development Procedures Manual for utility clearance and offset requirements.

For additional details regarding longitudinal utility encroachments on both conventional and access-controlled State highway right-of-way, see Section 602 of the Encroachment Permits Manual.

**UG 1. ENCASEMENT:** Casings must have an inside diameter sufficiently larger than the outside diameter of the pipe or duct to accommodate placement and removal.

When Horizontal Directional Drilling (HDD) is authorized, High-Density Polyethylene (HDPE) is acceptable as the casing.

When Reinforced Concrete pipe in accordance with Section 65-2 of Caltrans Standard Specifications is installed by Bore & Jack, it must have rubber gaskets at the joints and see “D” below for grouting of voids left by jacking operations.

- A. Spiral welded casings may be allowed provided the casing is new and the weld is smooth.
- B. The ends of the casing must be plugged with ungrouted bricks or other suitable material approved by the Department’s representative.
- C. Minimum wall thicknesses of steel encasements for different lengths and diameters of pipes are as follows:

**Minimum Wall Thickness**

Casing Diameter	Up to 150 feet in length	Over 150 feet in length
6 to 28 inches	1/4 inch	1/4 inch
30 to 38 inches	3/8 inch	1/2 inch
40 to 60 inches	1/2 inch	3/4 inch
62 to 72 inches	3/4 inch	3/4 inch

- D. When required by the Department’s representative, the permittee must pressure grout to fill any voids

caused by the permitted work at the permittee’s expense. The grout holes when placed the inside of the casing must be on eight (8) feet centers, longitudinally and offset twenty-two (22) degrees from the vertical axis of the casing and staggered to the left and right of the top longitudinal axis of the casing. Grout pressure must not exceed five (5) psig for a duration sufficient to fill all voids.

- E. When the placement of multiple encasements is requested, the distance between multiple encasements must be the greater of twenty-four (24) inches or twice the diameter of the larger pipe being installed.
- F. Casings within access-controlled highways must extend to the right-of-way lines.
- G. Wing cutters, if used, must be a maximum of one (1) inch larger in diameter than the outside diameter of the casing. Voids caused by the use of wing cutters must be grouted in accordance with “D” above.
- H. A band welded to the leading edge of the casing must be placed square to the alignment and not on the bottom edge. A flared lead section on bores over one hundred (100) feet is not allowed.
- I. The length of the auger strand must be equal to that of the section of encasement pipe.
- J. The casings within conventional highways must extend at least five (5) feet beyond the back of curb or edge of pavement, or to the right-of-way line if less. Where Portland Cement Concrete (PCC) cross-gutter exists, the casings must extend at least five (5)

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feet beyond the back of the cross-gutter, or to the right-of-way line if less.

**UG 2. OPEN-CUT METHOD:** When the encroachment permit authorizes installation by the open-cut method, surfacing and base materials and thickness thereof must be as specified in the encroachment permit.

No more than one (1) lane of the highway pavement must be open cut at any time unless otherwise approved in writing by the Department's representative. After the pipe is placed in the open-cut section, the trench must be backfilled in accordance with Section 19-3 of Caltrans Standard Specifications. The backfilled section must be open to traffic safely with temporary repairs to the surfacing before the next section of pavement is cut.

If backfilling operations have not been properly completed at the end of a working day, steel plate bridging is required to make the entire highway facility open to traffic in accordance with the "Steel Plate Bridging Utility" Special Provisions (TR-0157).

Sides of open-cut trenches in paved areas must be kept as nearly vertical as possible. Trenches must not be two (2) feet wider than the sum of the outside diameter of the pipe to be laid therein plus the necessary width to accommodate shoring.

**UG 3. TRENCHLESS CONSTRUCTION:** The following provisions are applicable for installing conduit with the bore diameter less than thirty (30) inches using trenchless methods (e.g., Bore & Jack, HDD, Microtunneling, Pipe Bursting, Pipe Ramming, etc.). For installations with the bore diameter equal to or greater than thirty (30) inches, permittees must comply with Non-Standard Special Provision (NSSP) 19-15, Trenchless Construction. A copy of the NSSP 19-15 can be obtained from the Department's representative or District Encroachment Permits Office.

### 3.1. Definitions

**Bore:** Borehole excavated using trenchless construction for the installation of conduit.

**Overcut:** Radial annular gap between bore and outer pipe wall.

**3.2. Construction:** The superintendent must be at the site at all times when work is being conducted, if the borehole diameter is greater than ten (10) inches and the depth of installation is less than eight (8) times the diameter of the borehole.

Trenchless excavation and conduit installation must be performed to the line and grade shown. When excavation or installation is out of line or grade, make immediate alignment correction.

Existing structures, pavement, and utilities must be protected during installation. Restore and repair immediately any damage resulting from construction.

Repair or replace any damaged pipe sections.

Overcut must be less than:

- A. One (1) inch or five (5) percent of the conduit outside radius, whichever is less, and
- B. Two (2) inches for trenchless construction using HDD method

Notify the Department's representative immediately if you encounter obstruction or condition that impedes construction.

### 3.3. Quality Assurance

**3.3-1. Pre-construction Meeting:** Contact the Department's representative to schedule and have a pre-construction meeting at least seven (7) business days before the start of trenchless construction or as identified in the permit.

Attendees should include:

1. The Department's representative
2. Your project manager
3. Your project superintendent
4. The contractor for trenchless construction

Provide and present:

1. Trenchless construction shop drawings, work plans, and calculations
2. Mitigation plans for both during and after construction
3. Construction timeline and critical path activities

**3.3-2. Contractor Qualifications:** The contractor must employ a superintendent, who has successfully completed at least five (5) of such projects, if the borehole diameter is greater than ten (10) inches and the depth of installation is less than eight (8) times the diameter of the borehole. Before pre-construction meeting, the following must be submitted to Department's representative if requested:

1. Summary of the contractor's experience demonstrating that the contractor has successfully completed at least five (5) projects in the past five (5) years using similar trenchless construction in similar ground and groundwater conditions with similar drive lengths and diameter range.
2. Summary of the superintendent's experience demonstrating that the superintendent has successfully completed at least five (5) projects using similar construction methods for trenchless construction in similar ground and groundwater

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conditions with similar drive lengths and diameter range.

**3.3-3. Conduit Line, Grade, and Shape:** When monitoring is required:

1. Survey and record control lines at least seven (7) business days before trenchless construction.
2. Observe and adjust measurements of survey control lines weekly. Report discrepancies to the Department's representative.

Survey and record the centerline of the constructed conduit after each section is advanced or every five (5) feet of advancement, whichever is shorter.

**3.3-4. Ground Surface Movement Monitoring:** Ground surface movement monitoring is required if the installation meets the following criteria or if required by the Department's representative:

1. Bore diameter is greater than ten (10) inches, and
2. Minimum vertical distance between the pavement or sidewalk surface and the top of bore is less than eight (8) times the diameter of the borehole.

Mark monitoring points on critical structures and utilities at locations shown. Include these points in monitoring surveys. Perform monitoring surveys before noon and at ambient temperature below eighty-five (85) degrees Fahrenheit. Perform ground surface survey under the Caltrans Surveys Manual and supplemental guidance.

Establish a minimum of four (4) control points for ground surface movement monitoring. Perform baseline ground surface survey at least fifteen (15) business days before trenchless construction. Notify the Department's representative at least ten (10) business days before the survey.

Develop baseline surface model. Use the baseline surface model to determine the movement of ground surface and embankment slope. See Encroachment Permit Survey Grid (TR-0151) in Appendix E of the Encroachment Permits Manual for survey grid spacing and other requirements.

Perform ground surface movement monitoring survey:

1. Weekly during construction or as required by the Department's representative
2. Biweekly for one (1) month after completion of each installation or as required by the Department's representative

Produce the surface model based on the monitoring survey data and calculate the movement of monitoring points using baseline surface model. Each monitoring survey may have different grid points.

Each ground surface horizontal and vertical measurement must be accurate to  $\pm 0.03$  feet on pavement and  $\pm 0.1$  feet

on unpaved surfaces at the ninety-five (95) percent confidence level. Vertical movement produced by comparing current surface model with pre-construction surface model must be accurate to  $\pm 0.01$  feet on pavement and  $\pm 0.1$  feet on unpaved surfaces at the ninety-five (95) percent confidence level.

If ground surface movement in the pavement above the advancing pipe meets the requirements for two (2) consecutive weeks, the frequency of monitoring survey may be reduced to biweekly.

Notify the Department's representative at completion of each installation. Ground surface vertical movement requirements are:

#### Ground Surface Vertical Movement

Quality Characteristic	Requirement
Critical Structure Monitoring Points - Horizontal or Vertical (max, feet)	0.02
Highway surface (max, feet)	0.04
Embankment slope (max, feet)	0.2

If ground surface vertical movement requirements are not met:

1. Stop work immediately.
2. Notify the Department's representative.
3. Submit an alternative construction method.
4. Submit a mitigation plan that includes methods to fill the voids created under the ground surface and restore the density of subsurface materials.
5. Monitor ground surface movement in the area above the advancing pipe:
  - 5.1. Daily until no additional vertical movement is detected in the areas that exceed the movement requirements
  - 5.2. Every two (2) working days until the vertical movement meets the requirements for two (2) consecutive weeks

### 3.4. Submittals

**3.4-1. Monitoring Plans:** Submit monitoring plans for:

1. Conduit grade and alignment control, including monitoring instruments, layout of instrumentation points, construction details, and monitoring frequency
2. Logging of excavated materials, including anticipated volume of excavation and measured volume of removed spoil
3. Critical operations of applicable trenchless construction, including excavation, boring, spoil removal, lubrication, jacking, installation, and grouting
4. Ground surface movement, including digital surface survey method, survey data processing and analysis

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method, and digital surface file for the bore diameter greater than ten (10) inches and the vertical distance between the pavement or sidewalk surface and the top of bore less than eight (8) times the diameter of the borehole

**3.4-2. Daily Construction Record:** Maintain Daily Construction Record and submit to the Department's representative upon request.

Daily Construction Record must include:

1. Date and time of operation
2. Names of key personnel
3. Length of constructed conduit, including coordinates and elevation of the beginning and ending (latitude, longitude and northing, easting, elevation) of the conduit advanced during each work shift. Record must reference the project coordinate system.
4. Rate of advance
5. Jacking force
6. Problems encountered, possible causes, and mitigation performed
7. Geological log of excavated face and materials, with the logging performed by a geologist who is registered as an engineering geologist in the State
8. Records and field note of:
  - 8.1. Any visible cracks
  - 8.2. Conduit line and grade control
  - 8.3. Anticipated and actual volumes of spoil removed and causes of the volume discrepancy
  - 8.4. Groundwater table elevation if dewatering is required

**3.4-3. Ground Surface Movement Monitoring**

**Records:** Submit:

1. Before construction: survey data and surface model to demonstrate compliance with the Caltrans Surveys Manual and supplemental guidance
2. During and after construction: survey data, surface model, and vertical movement based on the comparison between current and pre-construction surface model

**3.4-4. Contact Grouting Record:** Maintain Contact Grouting Record and submit to the Department's representative upon request.

Contact Grouting Record must include:

1. Injection locations
2. Grout quantity]
3. Grout pressure
4. Measurements and observations, including heave, casing or carrier pipe movement, grout loss quantity,

communication between grout ports, ground surface, and nearby utilities and storm drains

5. Problems encountered, possible causes, and mitigation performed

**3.4-5. Post-Construction Record:** Maintain Post-Construction Record and submit to the Department's representative upon request.

Post-Construction Record must include:

1. Completed conduit construction inspection records, including video recording and photographs
2. As-built plans showing details and alignment of the constructed conduit, horizontal and elevation survey based on project coordinate system, any problems encountered, and mitigation actions performed
3. As-built plans showing details of pavement restoration work performed

**3.5. Restore Highway Pavement:** After completion of trenchless construction of conduit, restore highway pavement to conditions as it was prior to beginning of construction activities or better. Restore Asphalt Concrete (AC) pavement with mill and fill. Repair or replace AC pavement with dowels for any cracks and spalling caused by construction.

**UG 4. Bore and receiving pits must:**

1. be located at least ten (10) feet from the edge of pavement on rural conventional highways.
2. be located at least five (5) feet beyond the concrete curb and gutter or AC dike on urban conventional highways.
3. be located at least five (5) feet beyond the toe of slope of embankments.
4. be located outside access-controlled highway right-of-way.
5. be protected by placement of six (6)-foot chain link fence or Type K railing around them.
6. be adequately shored in accordance with Cal/OSHA requirements. Shoring for jacking and receiving pits located within fifteen (15) feet of traffic lanes on a State highway must not extend more than thirty-six (36) inches above the pavement grade unless otherwise authorized by Department's representative. Reflectors must be affixed to the shoring on the sides facing traffic. A six (6)-foot chain link fence must be installed around the perimeter of the pits during non-working hours.
7. have crushed rock and sump areas to clear groundwater and water used to clean the casing. Where groundwater is found and pumping is required, the pits must be lined with filter fabric.

**UG 5. LIMIT OF EXCAVATION:** No excavation is allowed within ten (10) feet from the edge of pavement

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except in curbed urban areas or as specified in the encroachment permit. Where no curb exists and excavations within ten (10) feet of the traveled way are to remain open, a temporary Type K railing must be placed at a 10:1 taper or as otherwise directed by the Department's representative.

**UG 6. TUNNELING:** In addition to the requirements of "UG 1" and Section 603.6 of the Encroachment Permits Manual, the following requirements are also applicable:

- A. For this provision, a tunnel is defined as any installation that is thirty (30) inches or greater in diameter.
- B. When tunneling is authorized, the permittee must provide full-time inspection of tunneling operations. The Department's representative must monitor projects.
- C. Sand shields may be required as ground conditions change.
- D. Pressure grouting for liner plate, rib and spiling, or rib and lagging tunnels must be at every eight (8) feet section or the end of work shift before the next section is excavated. All grouting must be completed by the end of each workday.
- E. The headway must be secured at the end of each workday. Breast boards or plates must be installed during working hours for running sand or super-saturated soil.

**UG 7. FACILITIES EXEMPT FROM UTILITY POLICIES:** The following utilities are exempt from the requirements for location and depiction on the project plans unless the depiction of the utility is needed for interconnectivity with the proposed work (see Chapter 17 of the Project Development Procedures Manual):

- Natural gas service lines less than two (2) inches in pipe diameter that have normal operating pressures of sixty (60) psig or less
- Service connections (laterals) for water, sewer, electric, and telecommunication including fiber optic and cable service

All State-owned utilities must be plotted on the plans.

**UG 8. DETECTOR STRIP:** A continuous metallic detectable strip must be provided for non-metallic main utility installations. Service connections must be installed at right angles to the centerline of the State highway.

**UG 9. BACKFILLING:** All backfilling operations must be in accordance with Section 19-3 of Caltrans Standard Specifications.

Any required compaction tests must be performed by a certified laboratory at no cost to the Department and the

laboratory report must be furnished to the Department's representative.

**UG 10. ROADWAY SURFACING AND BASE MATERIALS:** Temporary repairs to pavements must be made and maintained upon completion of backfill until permanent repairs are made. Permanent repairs to pavements must be made within thirty (30) calendar days of completion of backfill unless otherwise authorized by the Department's representative. Temporary pavement patches must be placed and maintained in a smooth riding plane free of humps and depressions.

**UG 11. DAMAGE TO TREE ROOTS:** Tree roots three (3) inches or larger in diameter must not be cut within the tree drip line when trenching or other underground work is necessary adjacent to roadside trees. If such roots are encountered, they must be tunneled under, wrapped in burlap, and kept moist until the trench is backfilled. Trenching machines must not be used under trees if the trunk or limbs can be damaged by their use. Manholes must not be installed within twenty (20) feet of any trunk.

If the trees involved are close together and of such sizes that it is impractical to protect all roots three (3) inches or larger in diameter, or when roots are less than four (4) inches in diameter, outside tree drip line, special arrangements may be made whereby pruning of the tree tops to balance the root loss can be done by the permittee only when approved by and under the close supervision of the District Landscape Specialist or District Tree Maintenance Supervisor.

**UG 12. PIPES ALONG ROADWAY:** Pipes and conduits paralleling the pavement must be located as shown on the plans or as close as possible to the right-of-way line.

**UG 13. BORROW AND WASTE:** Borrow and waste must not be allowed within the work limits unless otherwise specified in the encroachment permit.

**UG 14. MARKERS:** All markers must not create a safety hazard for the traveling public or highway workers.

**UG 15. CATHODIC PROTECTION:** The permittee must perform stray current interference tests on underground utilities under cathodic protection and notify the Department's representative prior to the tests. The permittee must perform any corrective measures as necessary and authorized by the Department's representative.

**UG 16. PAVEMENT REMOVAL:** ASPHALT CONCRETE (AC) pavement must be saw cut to the full depth to provide a neat and straight pavement break along sides of the trench. Portland Cement Concrete (PCC)

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pavement must be saw cut at the slab joints and to the full slab depth.

Where the edge of the trench is within two (2) feet of the existing curb and gutter or pavement edge, the AC pavement between the trench and the curb or pavement edge must be removed.

**UG 17. EXCAVATION UNDER FACILITIES:**

Where it is necessary to excavate under the existing curb and gutter or underground facilities, the void must be backfilled with two (2) sack cement-sand slurry.

**UG 18. PERMANENT REPAIRS TO PCC**

**PAVEMENT:** Repairs must be of PCC containing at least six hundred fifty-eight (658) pounds or seven (7) sacks of cement per cubic yard. The new pavement must have the same thickness as the adjacent pavement. The PCC must be satisfactorily cured and protected from

disturbance until it can be open to traffic with a compressive strength of at least 3,000 psig or for not less than forty-eight (48) hours. The new pavement may be open to traffic after six (6) hours of curing when no more than two (2) percent by weight of calcium chloride is added to the PCC mix as an accelerating chemical admixture.

**UG 19. REMOVAL OF PCC SIDEWALKS OR**

**CURBS:** PCC sidewalks or curbs must be saw cut to the nearest score marks and reconstructed to match the existing sidewalk or curb.

**UG 20. SPOILS:** No earth or construction materials must be tracked onto the highway pavement and public or private approach. The permittee must remove these materials immediately if tracked from the highway pavement and public or private approach.



**ENCROACHMENT PERMIT SPECIAL PROVISIONS****STORMWATER SPECIAL PROVISIONS FOR MINIMAL OR NO IMPACT (SWSP)**

TR-0400 (Rev 05/2018)

1. **GENERAL:** The purpose of these Special Provisions is to provide the Permittee with specifications for water pollution control to minimize, prevent, or control the discharge of material into the air, surface waters, groundwater, and storm sewers owned by the State or local agencies. These provisions are not intended to take the place of the Caltrans Water Pollution Control Program (WPCP) for projects where soil disturbance from work activities less than one acre, or work activities of one acre or more subject to the preparation of the Caltrans Storm Water Pollution Prevention Plan (SWPPP). The Permittee must comply with the following Special Provisions and the direction of the State Representative. All Stormwater Best Management Practices (BMPs) must conform to Section 13 Water Pollution Control of Caltrans' Standard Specifications.
2. **NPDES REQUIREMENTS:** The Permittee must be responsible for full compliance with the Caltrans Storm Water Program and the Caltrans National Pollutant Discharge Elimination System (NPDES) Permit requirements (*Order No. 2012-0011-DWQ, NPDES No CAS000003*) and for and projects disturbing one acre or more of soil, full compliance with the California Construction General Permit (*Order No. 2009-0009-DWQ, NPDES No CAS000002*) or for projects for projects that have one acre or more of soil disturbance in the Lahontan Region (*Order No. R6T-2016-0010, NPDES No CAG616002*). It is the Permittee's responsibility to install, inspect, and repair or maintain facilities and devices used for water pollution control practices (BMPs) before performing daily work activities. Installation, inspection and maintenance responsibilities on the job site include: 1) soil stabilization materials in work areas that are inactive or prior to storm events, 2) water pollution control devices to control sediment and erosion, 3) implementation of spill and leak prevention procedures for chemical and hazardous substances stored on the job site, 4) material storage, 5) stockpile management, 6) waste management, 7) non-stormwater management, 8) water conservation, 9) tracking controls and 10) illicit connection, illegal discharge detection and reporting. The Permittee must report to the State representative when discharges enter into receiving waters, adjacent property, drainage systems or when discharges could be a cause or a threat for water pollution. The Permittee must also control illicit discharges or illegal dumping prior to start of daily work schedule. Copies of written notices or orders from the Regional Water Quality Control Board or other regulatory agency must be provided to the State representative within 48 hours of reported activity. For additional information on stormwater compliance, visit the State Water Resources Control Boards storm water Website at:
 

[http://www.waterboards.ca.gov/water\\_issues/programs/stormwater](http://www.waterboards.ca.gov/water_issues/programs/stormwater)
3. **RESPONSIBILITY FOR DEBRIS REMOVAL:** The Permittee must be responsible for preventing sediment, trash, debris, and other construction waste from entering the street, the storm drains, local creeks, or any other bodies of water.
4. **SPOILS AND RESIDUE:** The Permittee must vacuum any saw-cut concrete waste material, debris, residue, etc. No spoils, debris, residue, etc. must be washed into a drainage system.
5. **SWEEPING:** Sweep paved roads at construction entrance and exit locations and surrounding paved areas daily within the job site during: 1) clearing and grubbing, 2) earthwork, 3) trenching, 4) soil disturbance, 5) pavement grinding and/or cutting, and 6) after observing tracking of material onto or off the State property. Keep dust to a minimum during sweeping activities. Use vacuum whenever dust generation is excessive or sediment pickup is ineffective. Roadways or work areas must not be washed down with water. Street sweeping operations must conform to Section 13 Water Pollution Control of Caltrans' Standard Specifications.
6. **VEHICLES AND EQUIPMENT:** Permittee must prevent all vehicles, equipment, etc. from leakage or mud tracking onto roadways. If leaks cannot be repaired immediately, remove the vehicle or equipment from the job site.
7. **MAINTENANCE AND FUELING OF VEHICLES AND EQUIPMENT:** Maintenance and fueling of equipment must not result in any pollution at the job site. The Permittee must immediately clean up spills/leaks, and properly dispose of contaminated soil and materials.
8. **CLEANING VEHICLES AND EQUIPMENT:** Limit vehicle and equipment cleaning or washing at the job site except what is necessary to control vehicle tracking or hazardous waste. The Permittee must clean all equipment within a bermed area or over a drip pan large enough to prevent run-off. No soaps, solvents, degreasers, etc. must be used in State right-of-way. Any water from this operation must be collected and disposed of at an appropriate site. Containment berms or dikes must be used for fueling, washing, maintaining and washing vehicles or equipment in outside areas. Containment must be performed at least 100 feet from concentrated flows of

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storm water, drainage courses, and storm drain inlets if within a flood plain, otherwise at least 50 feet if outside the floodplain. Keep adequate quantities of absorbent spill- cleanup material and spill kits in the fueling or maintenance area and on fueling trucks.

9. **DIESEL FUELS:** The use of diesel fuel from petroleum or other fossil fuel as a form-oil or solvent is not allowed.
10. **WEATHER CONDITIONS AT WORKSITE:** Any activity that would generate fine particles or dust that could be transported off site by stormwater must be performed during dry weather.
11. **WIND EROSION PROTECTION:** The use of Wind Erosion BMPs must be deployed year-round in instances where dust or fine particles could be transported off site.
12. **HOT MIX ASPHALT:** Runoff from washing hot mix asphalt must not enter into any drainage conveyances.
13. **PROTECTION OF DRAINAGE FACILITIES:** The Permittee must protect/cover gutters, ditches, drainage courses, and inlets with gravel bags, fiber rolls, State approved fabric filters, etc., to the satisfaction of the State representative during grading, paving, saw-cutting, etc. and materials must conform to Section 13-6.02 Materials for Water Pollution Control of Caltrans' Standard Specifications. No such protection measures must cause an obstruction to the traveling public. The Permittee must implement spill and leak prevention procedures for chemicals and hazardous substances stored on the job site (including secondary containment requirements) in accordance with section 13-4.03B Spill Prevention and Control, and 14-11 Hazardous Waste and Contamination, Water Pollution Control of Caltrans' Standard Specifications.
14. **PAINT:** Rinsing of painting equipment and materials is not permitted in State right-of-way. When thoroughly dry, dispose of the following as solid waste: dry latex paint, paint cans, used brushes, rags, gloves, absorbent materials, and drop cloths. Oil based paint sludge and unusable thinner must be disposed of at an approved hazardous waste site.
15. **CONSTRUCTION MATERIALS:** Stockpile of all construction materials, including, but not limited to; pressure treated wood, asphalt concrete, cold mix asphalt concrete, concrete, grout, cement containing premixes, and mortar, must conform to section 13-4.03C (2) Material Storage & 13-4.03C (3) Stockpile Management of Caltrans' Standard Specifications.
16. **CONCRETE EQUIPMENT:** Concrete equipment must be washed in a designated washing area in a way that does not contaminate soil, receiving waters, or storm drain systems.
17. **EXISTING VEGETATION:** Established existing vegetation is the best form of erosion control. Minimize disturbance to existing vegetation. Damaged or removed vegetation must be replaced as directed by the State Representative.
18. **SOIL DISTURBANCE:** Soil disturbing activities must be avoided during the wet weather season. If construction activities during wet weather are allowed in your permit, all necessary erosion control and soil stabilization measures must be implemented in advance of soil disturbing activity.
19. **SLOPE STABILIZATION AND SEDIMENT CONTROL:** Consider a certified expert in Erosion and Sediment control in cases where slopes are disturbed during construction. The Permittee is directed to comply with Section 13.5 Temporary Soil Stabilization and Section 21 Erosion Control of Caltrans' Standard Specifications during application of temporary soil stabilization measures to the soil surface. Fiber rolls or silt fences may be required down slope until permanent soil stabilization is established. Remove the accumulated sediment whenever the sediment accumulates to 1/3 of the linear sediment barrier height. The Permittee must limit the use of plastic materials when more sustainable, environmentally friendly alternatives exist or when environmental regulations prohibit their use within the project.
20. **STOCKPILES:** Stockpiles containing aggregate and/or soil must be stored at least 100 feet from concentrated flows of storm water, drainage courses, and storm drain inlets if within a flood plain, otherwise at least 50 feet if outside the floodplain, and must be covered and protected with a temporary perimeter sediment barrier. Cold mix stockpiles must be stored on an impermeable surface and covered with 9 mil plastic to prevent contact with water. Minimize stockpiling of materials on the job site. Manage stockpiles by implementing the water pollution control practices in Section 13-4.03C (3) Stockpile Management of the State of California standard specifications for construction.
21. **DISCOVERY OF CONTAMINATION:** The State Representative must be notified in case any unusual discoloration, odor, or texture of ground water, is found in excavated material or if abandoned, underground tanks, pipes, or buried debris are encountered.
22. **SANITARY AND SEPTIC WASTE:** Do not bury or discharge wastewater from a sanitary or septic system within the highway. Properly connected sewer facilities are free from leaks. With State Representative approval place portable sanitary facility at least 50 feet away from storm drains, receiving waters, and flow lines. Permittee must comply with local health agency provisions when using an on-site disposal system.
23. **LIQUID WASTE:** Prevent job site liquid waste from entering storm drain systems and receiving waters. Drilling slurries, grease or oil-free waste water or rinse water, dredging, wash water or rinse water running off a surface or other non-storm water liquids not covered

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under separate waste water permits must be held in structurally sound, leak-proof containers, such as portable bins or portable tanks. Store containers at least 50 feet away from moving vehicles and equipment. Liquid waste may require testing to determine hazardous material content prior to disposal. All measures must conform to section 13-4.03D (5) Liquid Waste, Water Pollution Control of Caltrans' Standard Specifications.

**24. WATER CONTROL AND CONSERVATION:**

Manage water use in a way that will prevent erosion and the discharge of pollutants into storm drain systems and receiving waters. Direct runoff, including water from water line repair from the job site to areas where it can infiltrate into the ground. Direct water from off-site sources around the job site or from contact with jobsite runoff.

**25. PILE DRIVING:** Keep spill kits and cleanup materials at pile driving locations. Park pile driving equipment over drip pans, absorbent pads, or plastic sheeting with absorbent material, and away from stormwater run-on when not in use.**26. DEWATERING:** Dewatering consists of discharging accumulated storm water, groundwater, or surface water from excavations or temporary containment facilities. All dewatering operations must comply with the latest Caltrans guidelines including the Field Guide for Construction Site Dewatering. Contact State representative for approval of dewatering discharge by infiltration or evaporation, otherwise, any effluent discharged into a permitted storm water system requires approval from the Regional Water Quality Control Board. Prior to the start of dewatering, the Permittee must provide the State Representative with a dewatering and discharge work plan that complies with section 13-4.03G Dewatering, Water Pollution Control of Caltrans' Standard Specifications. A copy of the Waste Discharge Permit and a copy of a valid WDID number issued by the Regional Board must be provided to the State representative.

## **TRAFFIC STRIPING, MARKINGS, AND SIGNS**

In addition to the attached Encroachment Permit General Provisions (TR-0045), the following special provisions are also applicable:

1. Traffic striping, pavement markings and signs shall be furnished and placed by the permittee and the cost shall be borne by the permittee. Where new asphalt concrete has been placed, painted striping and pavement markings shall be installed within 24-hours. Where shown on the plans, after thirty (30) days curing time, thermoplastic materials shall be applied in compliance with Section 84 of the Standard Specifications.
2. Roadside signs shall be placed at locations shown on the permit plans and shall be installed in compliance with the latest edition of Caltrans Standard Plans.
3. Permittee shall furnish to State's representative a completed Form CEM-3101 "Notice of Materials to be Used," and approval of the material used shall be obtained prior to its installation.

## **SURVEYS (SV)**

In addition to the attached Encroachment Permit General Provisions (TR-0045), the following special provisions are also applicable:

1. Two days before work is started under this permit, contact \_\_\_\_\_ concerning the permittee's operation.
2. All survey operations shall be conducted off the traveled way except where necessary to cross pavements and medians.
3. When survey operations are being conducted, the permittee shall furnish, place and maintain signs and safety equipment in accordance with the latest edition of the "California Manual on Uniform Traffic Control Devices" (Part 6, Temporary Traffic Control).
4. All personnel shall wear hard hats and orange vests, shirts or jackets as appropriate. Any painted markings shall be made with water soluble paint.
5. Permission is also granted to park survey vehicles temporarily within the right of way, outside the shoulders, while survey work is in progress.
6. SURVEY WORK IS PROHIBITED ON FREEWAYS.
7. Survey information and assistance may be obtained upon request to: Survey Section, Department of Transportation, \_\_\_\_\_.

## **SIDEWALKS (CS)**

In addition to the attached Encroachment Permit General Provisions (TR-0045), the following special provisions are also applicable:

1. A State issued permit is required for any landscaping or tree installation, including installation of tree wells.
2. A separate permit must be obtained from Caltrans for any driveway, handicap-ramp installations or any sidewalks that are other than Portland Cement Concrete constructed in compliance with Caltrans Standard Specifications.
3. Traffic control is authorized only between 9 a.m. and 3 p.m., Monday through Friday, holidays excluded. Any traffic control that requires lane closure shall be in compliance with the appropriate traffic control plan. Where required by the plan, the use of a flashing arrowboard is MANDATORY.
4. New curb and gutter installations shall be State Standard Type A2-6, unless necessary to conform to existing adjacent curb and gutter installations.
5. The minimum width of a sidewalk should be 8 feet between a curb and a building when in urban and rural main street place types. For all other locations the minimum width of sidewalk should be 6 feet when contiguous to a curb or 5 feet when separated by a planting strip.
6. Alignment and grade of gutter and sidewalk shall match the existing.
7. Existing concrete curb and paved shoulder shall be saw cut to a neat line prior to excavating and forming. Existing concrete sidewalk shall be saw cut at the scoreline. Paved shoulder shall be replaced with asphalt concrete paving material equal "in kind" and thickness to existing shoulder and shall conform to lip of new curb and gutter.
8. Permittee shall be responsible for the relocation or adjustment of any utility required as the result of work authorized by this permit, and utility relocation shall be completed prior to the installation of any new curb, gutter or sidewalk.
9. A monolithic pour of sidewalk and curb and gutter shall not be permitted.

**HAZARDOUS MATERIALS AND HAZARDOUS WASTE MANAGEMENT SPECIAL PROVISIONS**TR-0408 (New 09/2017)

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By acceptance of this encroachment permit, Permittee hereby agrees that:

1. All construction debris/materials/water/excess soil must become the property of the Permittee, and must be transported and disposed of, outside of Caltrans' right-of-way, in accordance with all applicable environmental laws and regulations. The Permittee must be identified as the generator for all construction debris/materials/water/excess soil and must be responsible for proper identification (including sampling and analysis) and management of all construction and contaminated debris/materials/water/excess soil that are removed, and/or excavated, from the work site. If hazardous waste is generated, the Permittee must obtain an Environmental Protection Agency (EPA) Identification Number issued in their name. State Permit Inspector does not sign any manifests or shipping papers. The Permittee must be named as the generator on all Uniform Hazardous Waste Manifests and shipping papers. Caltrans must not be identified or written anywhere on the manifests or shipping papers. Prior to waste disposal, the Permittee should submit the waste generator form(s) to State Permit Inspector for verification. The Permittee must submit to the State Permit Inspector, a copy of all manifests and/or shipping papers generated for materials removed, transported and/or excavated from the state right-of-way.
2. If contaminated material is encountered, Permittee is to stop work and contact the State Permit Inspector immediately. The Permittee must submit a Sampling and Analysis Plan (SAP), and a Health and Safety Plan (HaSP) prepared by a Certified Industrial Hygienist (CIH) and in conformance with California Code of Regulations title 8, section 5192, "Hazardous Waste Operations and Emergency Response" for sampling activity through a separate permit application. Upon the permit review, additional environmental documents may be required prior to resumption of construction activity.
3. Permittee is responsible for any violation, penalty, enforcement action, corrective action, remedial action, and any other type of consequences resulting from cross contamination of groundwater (including perched groundwater), improper handling/managing of hazardous materials and/or placement of contaminated materials inside Caltrans right-of-way.
4. It is the Permittee's responsibility to comply with the Department of Toxic Substances Control (DTSC) ADL requirements for roadway soil management. Reuse of soils containing greater than 80 mg/kg total lead is not allowed without written approval of the DTSC and Caltrans. The Soil Management Agreement for Aerially Deposited Lead-Contaminated Soils between Caltrans and the DTSC does not constitute written approval for the Permittee to reuse soils containing greater than 80 mg/kg total lead.
5. The Permittee must implement the emergency notification requirements established in the California Office of Emergency Management Hazardous Materials, Spill / Release Notification Guidance (<http://www.caloes.ca.gov/>).
6. Any imported material used for backfill must be free of contamination, and a certificate of the material as "clean" with the source area of the material must be provided to Permit Inspector upon request. Importing soils containing greater than 80 mg/kg total lead for use in state right-of-way is not allowed.
7. Stockpiles of material containing aerially deposited lead shall not be placed where affected by surface run-on or run-off. Stockpiles shall be covered with plastic sheeting 13 mils minimum thickness or with one foot of nonhazardous material. Stockpiles shall not be placed in environmentally sensitive areas. Stockpiled material shall not enter storm drains, inlets, or waters of the State.

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION  
**ENCROACHMENT PERMIT STEEL PLATE BRIDGING UTILITY PROVISIONS**

TR -0157 (Rev. 04/2018)

To accommodate excavation work, steel plate bridging may be necessary. All conditions for use of steel plate bridging should be set forth in the special provisions.

Consideration of steel plate bridging should take into account the following factors:

1. Traffic speed.
2. Traffic Volume and Composition.
3. Duration and dimensions (width & daily estimated lengths) of the proposed excavation.
4. Weather conditions.

When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal, cannot be properly completed within a work day, steel plate bridging with a non-skid surface and shoring (see Trenching & Shoring) may be required to preserve unobstructed traffic flow. In such cases, the following conditions shall apply:

1. Steel plate bridging on freeways is not allowed.
2. Steel plates used for bridging must extend a minimum of 12" beyond the edges of the trench.
3. Steel plate bridging shall be installed to operate with minimum noise.
4. The trench shall be adequately shored, (as mentioned in Section 603.6B-2 of the Encroachment Permits Manual) to support the bridging and traffic loads.
5. Temporary paving with cold asphalt concrete shall be used to feather the edges of the plates, if plate installation by Method (2) described below, is used.
6. Bridging shall be secured against displacement by using adjustable cleats, shims, or other devices.

As required by the district, steel plate bridging and shoring shall be installed using either Method (1) or (2):

**Method 1** For speeds of 45 MPH or greater:

The pavement shall be cold planed to a depth equal to the thickness of the plate and to a width and length equal to the dimensions of the plate.

Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of 2 dowels pre-drilled into the corners of the plate and drilled 2" into the pavement. Subsequent plates are to be butted and tack welded to each other.

**Method 2** For Speeds less than 45 mph:

Approach plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of 2 dowels pre-drilled into the corners of the plate and drilled 2" into the pavement. Subsequent plates are to be butted and tack welded to each other. Fine graded asphalt concrete shall be compacted to form ramps, maximum slope 8.5 % with a minimum 12" taper to cover all edges of the steel plates. When steel plates are removed, the dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry, epoxy or an equivalent that is satisfactory to the Caltrans' representative.

The permittee is responsible for maintenance of the steel plates, shoring, asphalt concrete ramps, and ensuring that they meet minimum specifications. Unless specifically noted or granted in the special provisions, or approved by the State representative, steel plate bridging shall not exceed 4 consecutive working days in any given week. Backfilling of excavations shall be covered with a minimum 3" temporary layer of cold asphalt concrete.

The following table shows the advisory minimal thickness of steel plate bridging required for a given trench width (A-36 grade steel, designed for HS20-44 truck loading per Caltrans Bridge Design Specifications Manual).

Trench Width	Minimum Plate Thickness
10"	1/2"
1'-11"	3/4"
2'-7"	7/8"
3'-5"	1"
5'-3"	1 3/4"

NOTE: For spans greater than 5'-3", a structural design shall be prepared by a California registered civil engineer.

All steel plates within the right of way whether used in or out of the traveled way shall be without deformation. Inspectors can determine the trueness of steel plates by using a straight edge and should reject any plate that is permanently deformed.

Steel plates used in the traveled portion of the highway shall have a surface that was manufactured with a nominal Coefficient Of Friction (COF) of 0.35 as determined by California Test Method 342 (See Appendix H, Encroachment Permits Manual). If a different test method is used, the permittee may utilize standard test plates with known coefficients of friction available from each Caltrans District Materials Engineer to correlate skid resistance results to California Test Method 342. Based on the test data, the permittee shall determine what amount of surface wear is acceptable, and independently ascertain when to remove, test, or resurface an individual plate.

Caltrans Inspectors should not enforce plate removal unless it is permanently deformed or delivered without the required surfacing. However, an inspector should document in a diary all contacts with the contractor.

A "Rough Road" (W8-8) sign and a "Steel Plate Ahead" (W8-24) sign with black lettering on an orange background must be used in advance of steel plate bridging along with the required construction area signs. These signs must be used along with any other construction area signs.

Surfacing requirements are not necessary for steel plates used in parking strips, on shoulders not used for turning movements, or on connecting driveways, etc., not open to the public.