

CITY OF ORLAND

**GLENN COUNTY, CALIFORNIA** 

# CONTRACT DOCUMENTS

FOR

## ORLAND EMERGENCY GROUNDWATER RESOURCE PROJECT - PHASE 2A

August 2023

PREPARED BY:



SET NO. 01





# **GLENN COUNTY, CALIFORNIA**

#### CONTRACT DOCUMENTS

FOR

#### **ORLAND EMERGENCY GROUNDWATER RESOURCE PROJECT - PHASE 2A**

August 2023

Contract Documents were prepared by or under the direction of: Eduardo Cerna Alvarez, PE



Specification section TS 21 Structural Steel and Miscellaneous Metalwork was prepared by or under the direction of:

## Krishna Amirineni, PE



GEI Consultants, Inc. 2868 Prospect Park Drive, Suite 400 Rancho Cordova, CA 95670





NOTICE TO BIDDERS	7
1.00 NOTICE INVITING BIDS	7
2.00 GENERAL WORK DESCRIPTION	7
3.00 BID SUBMITTAL REQUIREMENTS	7
4.00 PREVAILING WAGES	8
5.00 APPRENTICESHIP STANDARDS	8
6.00 INSURANCE AND BONDS REQUIRED	8
	8
	0
10.00 CONTRACTOR'S QUALIFICATIONS	8
INSTRUCTIONS TO BIDDERS	11
1.00 INTRODUCTION	11
2.00 DEFINITION OF TERMS	11
3.00 PREPARATION AND SUBMISSION OF BIDS	12
4.00 WITHDRAWAL OF BIDS	12
5.00 BID GUARANTEE	12
6.00 ADDENDA AND EXPLANATIONS TO BIDDERS	12
	13
	13
	13
11.00 RETURN OF BID GUARANTEES	13
BID ITEM LIST	15
BIDDER INFORMATION	16
LIST OF SUBCONTRACTORS	17
	19
	13
	21
BIDDER'S SIGNATURE	23
BIDDER'S BOND	25
FORM OF CONTRACT	27
PERFORMANCE BOND	31
PAYMENT BOND	35

GENER/	AL CONDITIONS	37
1.00	SCOPE OF THE WORK	37
2.00	PROGRESS AND COMPLETION OF THE WORK	40
3.00	CONTROL OF THE WORK	41
4.00	INSURANCE AND LIABILITY	47
5.00	LABOR AND MATERIALS	49
6.00	MEASUREMENT AND PAYMENT	51
SPECIA		55
1.00	SCOPE OF THE WORK	55
2.00	PROGRESS AND COMPLETION OF THE WORK	56
3.00	CONTROL OF THE WORK	56
4.00	WORK ZONE SAFETY	59
5.00	INSURANCE REQUIREMENTS	60
APPEND	NX	63
APPE	NDIX A CITY OF ORLAND CERTIFICATE OF INSURANCE	63
TECHNI		67
TS 01		TS 01-1
TS 02		TS 02-1
TS 03	PRE-CON AUDIO VIDEO RECORDING	TS 03-1
TS 04	PROJECT IDENTIFICATION AND SIGNS	TS 04-1
TS 05	TRAFFIC CONTROL	TS 05-1
TS 06	WATER POLLUTION CONTROL	TS 06-1
TS 07	AS-BUILT PROJECT DOCUMENTS AND SURVEY	TS 07-1
TS 08	EXPLORATORY EXCAVATIONS	TS 08-1
TS 09	CLEARING, GRUBBING, AND DEMOLITION	TS 09-1
TS 10	TRENCH EXCAVATION AND BACKFILL	TS 10-1
TS 11	AC PAVEMENT	TS 11-1
TS 12	AGGREGATE BASE	TS 12-1
TS 13	CONCRETE CURBS, GUTTERS, AND SIDEWALKS	TS 13-1
TS 14	CONCRETE WORK	TS 14-1
TS 15	PROTECTIVE COATINGS	TS 15-1
TS 16	VALVES AND APPURTENANCES	TS 16-1
TS 17	WATER PIPE AND FITTINGS	TS 17-1
TS 18	FIRE HYDRANTS	TS 18-1
TS 19	METERS	TS 19-1
TS 20	FACILITY IDENTIFICATION	TS 20-1
TS 21	STRUCTURAL STEEL AND MISCELLANEOUS METALWORK	TS 21-1

#### 1.00 NOTICE INVITING BIDS

Sealed bids will be received at City Hall, City of Orland, 815 Fourth Street, Orland, California, 95963 until 2:00 p.m., **September 12, 2023**. At that time, all bids will be publicly opened, examined and declared for construction of:

### **ORLAND EMERGENCY GROUNDWATER RESOURCE PROJECT - PHASE 2A**

### 2.00 GENERAL WORK DESCRIPTION

The work to be done under this Contract consists of installing 5.1 miles of new water main and associated distribution laterals, meters and meter boxes to connect 114 properties to the City of Orland's existing water system, installing 27 fire hydrants, installing 6 blow off assemblies, and performing associated road repairs. Construction of domestic water services from the meter to the residence will be performed under another contract.

The work is comprised of 22 Bid Items. Bids are required for the entire work described herein. Based upon available funding, a contract, if awarded, will be awarded for the Base Bid.

Work shall be completed within <u>120</u> WORKING DAYS from the issuance of the Notice To Proceed by the Owner.

The Contractor shall possess either a Class A license or a combination of Class C licenses which constitutes a majority of the work at the time this contract is awarded. The Contractor must be properly licensed as a contractor from contract award through contract acceptance.

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in Division 2, Part 7, Chapter 1 of the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5 of the Labor Code. It is not a violation of Section 1771.1 for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

#### The Contractor is to carefully examine the site of the proposed work, and is to make his or her own determination of the scope of the work to be performed, including but not limited to the soil conditions and/or groundwater conditions to be encountered in performing the work, and he or she is to carefully examine these Contract Documents.

Inquiries or questions based on alleged patent ambiguity of the plans, specifications or estimate must be communicated as a bidder inquiry prior to bid opening. Any such inquiries or questions, submitted after bid opening, will not be treated as a bid protest. Bidders' inquiries may be presented to the City Engineer by phone at (530) 895-1422 or by U.S. Mail at Orland Emergency Groundwater Resource Project - Phase 2A, c/o Rolls Anderson & Rolls, 115 Yellowstone Drive, Chico, CA 95973.

## 3.00 BID SUBMITTAL REQUIREMENTS

Bids are required for the entire work described herein and no bid will be accepted unless it is made on forms furnished by the City of Orland. To ensure consideration, the Bid must be enclosed in a sealed envelope, clearly marked BID which also bears the name of the project and the date and time set for opening of Bids. Each Bid must be accompanied by cash, certified or cashier's check, or bidder's bond made payable to the City of Orland for an amount equal to ten percent (10%) of the amount bid, such guaranty to be forfeited should the bidder to whom the Contract is awarded fail to execute the Contract.

No Bid will be accepted from a Contractor who is not currently licensed in accordance with the provisions of Chapter 9, Division III of the Business and Professions Code. Subcontractors shall also be licensed as required by said code.

Each bid shall also include the Contractor's Qualifications list as described in Section 10.00 Contractor's Qualifications.

### 4.00 PREVAILING WAGES

Pursuant to Section 1773 of the Labor Code of the State of California, the general prevailing wage rates in the county, or counties, in which the work is to be done have been determined by the Director of the California Department of Industrial Relations. These wages are set forth in the General Prevailing Wage Rates for this project, available at the City of Orland address and available from the California Department of Industrial Relations' Internet web site at <a href="http://www.dir.ca.gov/DLSR/PWD">http://www.dir.ca.gov/DLSR/PWD</a>. 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.

#### 5.00 APPRENTICESHIP STANDARDS

In accordance with the provisions of Part 7, Chapter 1, Article 2, Section 1777.5 of the Labor Code of the State of California, the prime contractor shall be responsible for fully complying with the provisions of this Section, as well as any regulations adopted by the Director of Industrial Relations, for all apprenticeable crafts or trades, and shall also assure compliance by his or her sub-contractors with respect to such apprenticeable crafts or trades.

### 6.00 INSURANCE AND BONDS REQUIRED

The successful bidder to whom the Contract is awarded will be required to furnish appropriate insurance certificates as required by Section 4.00 of the General Conditions and the Special Conditions. He or she shall also furnish a Payment Bond in an amount equal to the total Contract amount and a Faithful Performance Bond in the amount equal to the total Contract amount, with a corporate surety approved by the City of Orland.

## 7.00 PAYMENT OF RETENTION AND SUBSTITUTION OF SECURITIES

Five percent (5%) will be withheld from each progress payment made to the Contractor for work performed and will be held until completion of the work, its acceptance and the expiration of the period provided by law for filing of liens by laborers or materialmen. In accordance with the provisions of Public Contract Code Section 22300, securities may be substituted for any monies which the City may withhold pursuant to the terms of the Contract to insure performance.

## 8.00 BIDDER'S INFORMATION

Contract Documents, including Plans and Specifications, are available for inspection on the City of Orland's website: <u>www.cityoforland.com</u>; at the Valley Contractors Exchange at 951 E. 8<sup>th</sup> Street, Chico, California; and Shasta Builders Exchange at 2990 Innsbruck Drive, Redding, California. Copies are available for purchase at the Public Works Department located in the City Hall, City of Orland, 815 Fourth Street, Orland, California; and Rolls, Anderson & Rolls, 115 Yellowstone Drive, Chico, California, (530) 895-1422, for a **NON-REFUNDABLE PAYMENT** of \$1.00 per plan sheet and \$0.10 per bid book/technical specifications sheet, plus \$10.00 mailing charge if mailing is requested.

#### 9.00 BID AWARD

The Contract, if awarded, will be awarded within 30 days after the opening of Bids, to the lowest responsible bidder as determined by the City of Orland. The City reserves the right, in its sole discretion, to reject any and all bids for any reason whatsoever, or to waive minor irregularities in any bid, and to accept any bid.

#### 10.00 CONTRACTOR'S QUALIFICATIONS

The Contractor shall provide, as part of the Bid, a list with at least three (3) projects, of similar nature, that have been completed over the last five years. The Contractor shall provide:

- Type of project;
   Name of local agency;
   Contact person of local agency;
- 4. Phone number of local agency;
- Total project cost; and
   Time taken to complete project.

/s/ Ed Vonasek Ed Vonasek Public Works Director City of Orland

Date: August 14, 2023

Publish Date: August 14, 2023



#### 1.00 INTRODUCTION

Each Bid shall be in accordance with the Contract Documents prepared by GEI Consultants Inc., 2868 Prospect Park Drive, Suite 400, Rancho Cordova, CA 95670. Contract Documents are available as specified in the Notice to Bidders.

### 2.00 DEFINITION OF TERMS

### 2.01 CONTRACT DOCUMENTS

The Contract Documents consist of the Notice to Bidders, Instructions to Bidders, Bidder's Signature, Contract, General Conditions, Supplemental General Conditions, Special Conditions, Technical Specifications, Appendices, Plans, and any Addenda.

### 2.02 CONTRACT

The Contract is the written agreement covering the performance of the work and the furnishing of labor, materials, tools, and equipment in the construction of the work. It includes supplemental agreements amending or extending the work contemplated and which may be required to complete the work agreements covering alterations, amendments or extensions to the Contract and includes Contract Change Orders.

## 2.03 OWNER, CONTRACTOR, AND ENGINEER

The Owner, the Contractor, and the Engineer are those mentioned as such in the Special Conditions. They are treated throughout the Contract Documents as if each were of the singular number and the masculine gender.

### 2.04 BIDDER

Any individual, firm, partnership, or corporation submitting a Bid for the work contemplated, acting directly or through a duly authorized representative.

#### 2.05 BID

The offer of a Bidder for the work when made out and submitted on the prescribed Bid form, properly signed and guaranteed.

#### 2.06 BID GUARANTEE

The cash, cashier's check, certified check or Bidder's Bond accompanying the Bid submitted by the Bidder, as a guarantee that the Bidder will enter into a Contract with the Owner for the performance of the work if the Contract is awarded to him.

#### 2.07 EFFECTIVE DATE OF THE CONTRACT

The date on which the governing body or an authorized representative of the Owner awards the Contract.

#### 2.08 DATE OF EXECUTION OF THE CONTRACT

The date on which the Contract is signed by the Owner's authorized representative.

#### 2.09 DAYS

Unless otherwise specifically stated, the term "days" will be understood to mean calendar days.

## 2.10 WORK

The terms "work" or "Work" means all the work specified, indicated, shown or contemplated in the Contract Documents, including all alterations, amendments or extensions thereto made by Contract Change Order or other written orders of the Owner.

#### 2.11 SPECIFICATIONS

The term "specifications" refers to the terms, provisions and requirements contained herein and referred to as General Conditions, Special Conditions and Technical Specifications. Where Standard

Specifications such as those of ASTM, AASHTO, etc., have been referred to, the applicable portions of such Standard Specifications shall become a part of these Contract Documents.

## 2.12 PLANS

The term "Plans" refers to the official Plans, profiles, cross sections, elevations, details and other working drawings and supplementary drawings, or reproductions thereof, signed by the Engineer, which show the location, character, dimensions, and details of the work to be performed. Plans may either be bound in the same book as the balance of the Contract Documents or bound in separate sets, and are a part of the Contract Documents regardless of the method of binding.

### 3.00 PREPARATION AND SUBMISSION OF BIDS

Bids must be submitted on the forms bound in the Contract Documents and must be "wet signed" by the Bidder or his authorized representative. Any corrections to the entries made on the Bid forms must be initialed by the person signing the Bid.

Bidders must bid on all items appearing on the Bid Item List, unless specific directions allow for partial bids. Failure to bid all items may disqualify the Bid. If bids on all items are not required, Bidders shall insert the words "No Bid" where appropriate. Alternate bids will not be considered unless specifically called for in the Bid.

Telegraphic Bids or facsimile Bids will not be considered. Modifications to Bids already submitted will be allowed if received in writing, by facsimile or by telegram prior to the time fixed in the Notice to Bidders for opening of Bids. Modifications shall be submitted as such and shall not reveal the total amount of either the original or revised Bid.

In conformance with Public Contract Code Section 7106, a Noncollusion Affidavit is included in the Contract Documents. Signing the Bid shall also constitute signature of the Noncollusion Affidavit.

To ensure consideration, the Bid should be enclosed in a sealed envelope, clearly marked **BID** which also bears the name of the project and the date and time set for opening Bids. The sealed envelope containing the Bid should be filed at the place and before the time set for opening of Bids. Bids received after the time indicated will be returned unopened.

## 4.00 WITHDRAWAL OF BIDS

Any bidder may withdraw his Bid, either personally or by facsimile, telegraphic or written request at any time prior to the scheduled closing time for receipt of bids. No bidder may withdraw his bid for a period of 30 days after the date set for opening. Negligence on the part of the bidder in preparing his bid shall not constitute a right to withdraw his bid subsequent to the bid opening.

## 5.00 BID GUARANTEE

Bids shall be accompanied by cash, certified check, cashier's check or "wet signed" Bidder's Bond made payable to the Owner. The bidder's bond shall conform to the bond form in these Contract Documents and shall be properly filled out and executed. The bidder's bond form included in these documents may be used. Facsimile copies of checks or executed Bidder's Bonds will not be accepted. The Bid Guarantee must be enclosed in the same envelope with the Bid. The amount of the Bid Guarantee shall not be less than 10 percent of the total amount of the Bid.

## 6.00 ADDENDA AND EXPLANATIONS TO BIDDERS

Any request for explanation or interpretation of the Contract Documents must be made in writing at least seven (7) days before the time set for opening of Bids. Any explanation or interpretation will be made in the form of Addenda to the Contract Documents and shall be furnished to all Bidders. Bidders shall submit signed copies of all Addenda with their Bids. Oral explanations and interpretations will not be binding.

#### 7.00 DISCREPANCIES

In case of discrepancies between unit prices and totals, unit prices will prevail. In case of discrepancy between words and figures, words will prevail.

### 8.00 ACCEPTANCE OR REJECTION OF BIDS

The Owner reserves the right to reject any or all Bids and to waive any informality in any Bid.

The award of Contract, if made, will be to the lowest responsible Bidder whose Bid complies with the requirements of the Contract Documents. The award, if made, will be made within 30 days after the opening of Bids. If the lowest responsible Bidder fails to sign and return the Contract with acceptable bonds and certificates of insurance, the Owner may award the Contract to the next lowest responsible Bidder.

### 9.00 CONTRACT BONDS

The successful Bidder shall furnish a Performance Bond in the amount of 100 percent of the total Contract amount and a Payment Bond in the amount of 100 percent of the total Contract amount.

#### 10.00 EXECUTION OF CONTRACT

The effective date of the Contract shall be the date on which the governing body or an authorized representative of the Owner awards the Contract.

The Bidder whose Bid is accepted, and to whom the Contract is awarded, shall sign and return the Contract with acceptable bonds and certificates of insurance within 14 calendar days after receiving notice that the Contract has been awarded to him. Failure to do so shall be just cause for annulment of the award and for forfeiture of the Bid Guarantee.

Within seven (7) days after receiving the signed Contract with acceptable bonds, and evidence of satisfactory insurance, from the successful Bidder, the Owner's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.

## 11.00 RETURN OF BID GUARANTEES

Within 15 days after the award of the Contract, the Owner will return the Bid Guarantees, other than Bidder's Bonds, to all Bidders whose Bids are not to be further considered in awarding the Contract. Retained Bid Guarantees will be held until the Contract has been finally executed, after which all Bid Guarantees, other than Bidder's Bonds and any guarantees which have been forfeited, will be returned to the respective Bidders whose Bids they accompanied.



ltem No.	Description	Approx. Quantity	Unit Price	Total Price
1.	Mobilization/Demobilization	Lump Sum	Not Applicable	\$
2.	Environmental Compliance	Lump Sum	Not Applicable	\$
3.	Site Management	Lump Sum	Not Applicable	\$
4.	Potholing and Utility Coordination	Lump Sum	Not Applicable	\$
5.	Pavement Repair (Pavement Removal, Replacement, and Base)	Lump Sum	Not Applicable	\$
6.	Water System Tie-in Connection	4 EA	\$	\$
7.	Water Service Connection	114 EA	\$	\$
8.	10-inch PVC Pipe	20,901 LF	\$	\$
9.	8-inch PVC Pipe	2,035 LF	\$	\$
10.	6-inch PVC Pipe	1,472 LF	\$	\$
11.	4-inch PVC Pipe	2,215 LF	\$	\$
12.	Fire Hydrant Assembly	27 EA	\$	\$
13.	Blow Off Assembly	6 EA	\$	\$
14.	10-inch Gate Valve	35 EA	\$	\$
15.	8-inch Gate Valve	1 EA	\$	\$
16.	6-inch Gate Valve	2 EA	\$	\$
17.	4-inch Gate Valve	7 EA	\$	\$
18.	Hydrostatic Testing and Disinfection of Pipeline	Lump Sum	Not Applicable	\$
19.	Project Identification Sign	1 EA	\$	\$
20.	Large Utility (>12-inch Dia.) Crossing	12 EA	\$	\$
21.	Bridge Crossing – County Road 19	Lump Sum	Not Applicable	\$
22.	Bridge Crossing – County Road 200	Lump Sum	Not Applicable	\$
		τοτα	L BID AMOUNT	\$

# Base Bid: Orland Emergency Groundwater Resource Project - Phase 2A

TOTAL BID AMOUNT

Name Of Bidder:

Business P.O. Box:

Business Street Address:

(Please Provide Even If P.O. Box Used)

City, State, Zip Code:

Telephone No.:

Fax No.:

Contractor License No.:

Dir Registration No.:

As of March 1, 2015 Contractors (and sub-contractors) wishing to bid on public works contracts must be registered with the State Division of Industrial Relations and certified to bid on Public Works contracts. Please register at <a href="https://www.dir.ca.gov/Public-Works/Contractor-Registration.html">https://www.dir.ca.gov/Public-Works/Contractor-Registration.html</a>. The local agency will verify registration of all contractors and subcontractors on public works projects at bid and thereafter annually to assure that yearly registration is maintained throughout the life of the project.

In accordance with Title 49, Section 26.11 of the Code of Federal Regulations, and Section 4104 of the Public Contract Code of the State of California, as amended, the following information is required for each sub-contractor who will perform work amounting to more than one half of one percent (0.5%) of the Total Base Bid or \$10,000 (whichever is greater).

#### Photocopy this form for additional firms.

	Pid Itom & Description	Percentage of Bid Item	Contractor License Number
	Subcontractor Name & Location Bid item & Description Subcontracted		DIR Reg Number
NAME			
City, State			
NAME			
City, State			
NAME			
- 01 - 01 - 1			
City, State			
NAME			
City, State			
NAME			
City State			
NAME			
City, State			
City, State			
NAME			
City, State			

As of March 1, 2015 Contractors (and sub-contractors) wishing to bid on public works contracts must be registered with the State Division of Industrial Relations and certified to bid on Public Works contracts. Please register at <a href="https://www.dir.ca.gov/Public-Works/Contractor-Registration.html">https://www.dir.ca.gov/Public-Works/Contractor-Registration.html</a>. The local agency will verify registration of all contractors and subcontractors on public works projects at bid and thereafter annually to assure that yearly registration is maintained throughout the life of the project.

In accordance with Title 49, Section 26.11 of the Code of Federal Regulations, and Section 4104 of the Public Contract Code of the State of California, as amended, the following information is required for each sub-contractor who will perform work amounting to more than one half of one percent (0.5%) of the Total Base Bid or \$10,000 (whichever is greater).

#### Photocopy this form for additional firms.

	Bid Itom & Description	Percentage of Bid Item	Contractor License Number
Subcontractor Name & Location	Subcontractor Name & Location Bid Item & Description Subcontra	Subcontracted	DIR Reg Number
NAME			
City, State			
NAME			
	-		
City, State			
NAME	-		
City, State	-		
NAME			
City, State			
NAME	-		
City State			
NAME			
City, State			
NAME	•		
City, State	-		
NAME			
City, State			

### [LABOR CODE SECTION 1861]

STATE OF CA	LIFORNIA	)
		) ss
COUNTY OF		)

I, the undersigned, do hereby certify:

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.

Executed at \_\_\_\_\_\_.
On \_\_\_\_\_.

I certify under penalty of perjury that the foregoing is true and correct.

Contractor-Employer



#### NONCOLLUSION DECLARATION TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID

The undersigned declares:

I am the \_\_\_\_\_\_, the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on \_\_\_\_\_ [date], at Orland, California.

Note: The above Noncollusion Affidavit is part of the bid. Signing this Bid on the signature portion thereof shall also constitute signature of this Noncollusion Affidavit. Bidders are cautioned that making a false certification may subject the certifier to criminal prosecution.



Accompanying this Bid is \_\_\_\_\_\_, (cash, cashier's check, certified check or Bidder's Bond) in the amount equal to at least 10 percent of the total amount of the Bid.

The names of all persons interested in the foregoing bid as principals are as follows:

#### IMPORTANT NOTICE

If Bidder is a corporation, the legal name of the corporation shall be set forth below, together with the signature of the officer or officers authorized to sign Contracts on behalf of the corporation. If Bidder is a copartnership, the true name of the firm shall be set forth below, together with the signature of the partners authorized to sign Contracts in behalf of the copartnership; and if Bidder is an individual, his signature shall be placed below. If signature is by an agent, other than an officer of a corporation or a member of a partnership, a Power of Attorney must be on file with the Owner prior to opening of Bids or submitted with the Bid; otherwise, the Bid will be disregarded as irregular and unauthorized.

The undersigned further declares that he is a licensed Contractor in the State of California, and that the license which he holds is of the class required to perform the specified work.

License No. \_\_\_\_\_ Classification(s) \_\_\_\_\_

<u>ADDENDA</u> - This Bid is submitted with respect to the changes to the contract documents included in addenda number(s)

(Fill in addenda numbers if addenda have been received and insert, in this Bid, any Engineer's Estimate sheets that were received as part of the addenda.)

By my signature on this Bid I certify that I have read and understand the clauses and certifications which are a part of this bid and that my signature shall constitute an endorsement and execution of those clauses and certifications. I further agree that in case of default in signing and returning the required Contract with necessary bonds within 14 days after receiving notice of award, the proceeds of the cash, check or bond accompanying the Bid shall be forfeited to the Owner.

Date:

Signature and Title of Bidder

## **BIDDER'S SIGNATURE**

Business P.O. Box:	
Business Street Address:	
	(Please provide even if P.O. Box used)
City, State, Zip Code:	
Telephone No.:	
Fax No.:	
Contractor License No.:	
Dir Registration No.:	

KNOW ALL MEN BY THESE PRESENTS, THAT WE, THE UNDERSIGNED \_\_\_\_\_\_\_as Principal; And \_\_\_\_\_\_as Surety, are hereby held and firmly bound unto \_\_\_\_\_\_ hereinafter called the Owner, in the sum of \_\_\_\_\_\_\_), which sum is equal to at least 10 percent of the total ensure of the Did noursepart of which sum unliked to a bareby is in the and

the total amount of the Bid, payment of which sum, well and truly to be made, we hereby, jointly and severally bind ourselves, our heirs, executors, administrators, successors, and assigns.

The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain Bid, attached hereto and hereby made a part thereof, to enter into a Contract in writing, for the construction of:

### **ORLAND EMERGENCY GROUNDWATER RESOURCE PROJECT - PHASE 2A**

THEREFORE,

(a) If said Bid shall be rejected, or in the alternate,

(b) If said Bid shall be accepted and the Principal shall sign and deliver a Contract, in the Form of Contract attached hereto and shall execute and deliver Performance and Payment Bonds in the forms attached hereto (all completed in accordance with said Bid), and shall in all other respects perform the agreement created by the acceptance of said Bid.

Then, this obligation shall be void, otherwise the same shall remain in force and effect; it being expressly understood and agreed that the liability of the Surety for any and all default of the Principal hereunder shall be the amount of this obligation as herein stated.

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

IN WITNESS THEREOF, the above-bounded parties have executed this instrument under their several seals this \_\_\_\_\_\_ day of \_\_\_\_\_\_, 20\_\_\_\_\_, the name and corporate seal of each corporate party being hereto affixed and those presents duly signed by its undersigned representative pursuant to authority of its governing body.

IN PRESENCE OF:

	Individual Principal
Address	Business Address
	Individual Principal
Address	Business Address
	Corporate Principal
	Dusingge Address
	Business Address
	By
	Affix Corporate Seal
ATTEST:	
	Corporate Surety
	Business Address
	Corporate Seal
The rate of premium on this bond is per thousand.	
Total amount of premium charged is \$	·

THIS AGREEMENT, made and entered into on the date below written, by and between, **CITY OF** 

ORLAND, CALIFORNIA, A MUNICIPAL CORPORATION, 815 Fourth Street, Orland, California, 95963,

hereinafter called the OWNER, and \_\_\_\_

hereinafter called the **CONTRACTOR**.

WITNESSETH, that, for the considerations hereinafter mentioned, the Owner and Contractor agree as follows:

ARTICLE I. The Contractor agrees to furnish all labor, materials, tools, and equipment and to perform all the work required to construct and complete in a good and workmanlike manner, and in strict accordance with the Contract Documents entitled:

#### CONTRACT DOCUMENTS FOR ORLAND EMERGENCY GROUNDWATER RESOURCE PROJECT - PHASE 2A

The Contract Documents have been prepared by *GEI Consultants Inc.*, 2868 Prospect Park Drive, Suite 400, Rancho Cordova, CA 95670, hereinafter called the Engineer, and are hereby incorporated in and made a part of this Contract.

ARTICLE II. The Owner agrees to pay the Contractor for the performance of the Contract, subject to additions and deductions provided therein, the following prices, and the Contractor agrees to receive and accept said following prices as full compensation for furnishing all materials and for doing all the work contemplated and embraced in this agreement, and for all loss or damage arising out of the nature of the aforesaid work or from the action of the elements and from any unforeseen difficulties or obstructions which may arise or be encountered in the prosecution of the work until its acceptance by the Owner, and for all risks of every description connected with the work, and for all expenses incurred by or in consequence of the suspension or discontinuance of the work, and for well and faithfully completing the work and the whole thereof in the manner and according to the Contract Documents and the requirements of the Engineer under it, to wit:

As shown on the Bid attached hereto and incorporated herein.

ARTICLE III. The Owner shall make payments on the account of the Contractor as specified in Article 6.00 of the General Conditions.

ARTICLE IV. The Contractor shall commence work within 15 days and shall diligently prosecute the same to completion within <u>120</u> working days after receipt of a Notice to Proceed from the Owner.

ARTICLE V. The Contractor shall guarantee all of his work against defective material or faulty workmanship for a period of one year after the date of acceptance of the work by the Owner.

The Contractor shall repair or replace to the satisfaction of the Owner any or all such work that may prove defective in workmanship or materials within that period, ordinary wear and tear and unusual abuse or neglect excepted, together with any other work which may be damaged or displaced in so doing.

In the event of failure to comply with the above-mentioned conditions within a reasonable time after being notified in writing, the Owner is authorized to have the defects repaired and made good at the expense of the Contractor who will pay the cost and charges therefore immediately upon demand.

The signing of the Contract by the Contractor shall constitute execution of the above guarantees.

ARTICLE VI. The Contractor specifically obligates himself and hereby agrees to protect, hold free and harmless, defend and indemnify the Owner, the Engineer and his consultants, and each of their officers, employees and agents, from any and all liability, penalties, costs, losses, damages, expenses, causes of actions, claims or judgments, including attorney's fees, which arise out of or are in any way connected with the Contractor's performance of his work under this Contract. To the extent legally permissible, this indemnity and hold harmless agreement by the Contractor shall apply to any acts or omissions, whether active or passive, on the part of the Contractor or his agents, employees, representatives, or subcontractors, or his subcontractor's agents, employees and representatives, resulting in liability irrespective of whether or not any acts or omissions of the parties to be indemnified hereunder may have also been a contributing factor to the liability.

As a further precaution toward this end, the Contractor shall procure and maintain, in full force and effect during the performance of the work contemplated hereunder, insurance in his favor and also in favor of the Owner, with an insurance carrier approved by the Owner, as specified in Article 4.00 of the General Conditions and in the Special Conditions.

ARTICLE VII. Contractor acknowledges that State Labor Law requires the payment of prevailing wages and the maintenance of certain payroll records and other requirements as specified in Article 5.00 of the General Conditions and the Labor Code. Contractor agrees that these requirements shall be incorporated into all of his subcontracts.

ARTICLE VIII. Neither party of the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any monies due, or to become due to him hereunder, nor utilize any subcontractors, other than those set forth in the List of Subcontractors, without the previous written consent of the Owner.

ARTICLE IX. Contractor is an independent contractor in the performance of this contract and is not an employee or agent of the Owner. The Owner has no direct obligation to any officers, agents, employees or subcontractors of the Contractor and such individuals shall not be entitled to claim direct payment of salaries nor seek employment benefits from the Owner.

ARTICLE X. Contractor warrants that he is duly and properly licensed to perform and provide the services contemplated by this Contract. Contractor shall possess all required licenses, including a local business license and shall require subcontractors and suppliers to be similarly licensed with regard to performance under this Contract.

ARTICLE XI. The Contractor shall maintain records relating to his performance of this Contract which shall be available for audit and/or inspection for a period of three (3) years after Contractor completes performance of the Contract or the Contract is otherwise terminated.

ARTICLE XII. Any Notices given pursuant to this Contract must be in writing and given either by personal delivery or by United States Mail, postage prepaid, addressed as follows:

CONTRACTOR:

City of Orland Attn.: Pete Carr City Manager 815 Fourth Street Orland, CA 95963 ARTICLE XIII. The Owner may terminate this Contract, without cause, upon giving of five (5) days written notice to Contractor. In the event of termination without cause, Contractor shall be compensated for services performed and materials furnished on an equitable basis through the date of termination.

ARTICLE XIV. California Law governs the interpretation and enforcement of this Contract.

ARTICLE XV. This Contract embodies the entire agreement between the parties. There are no oral agreements. No amendment to this Contract shall be valid unless in writing, executed by both parties to this Contract. The language of this Contract governs against any conflicting language or terms contained in any attachment, exhibit or scope of work.

ARTICLE XVI. Neither the acceptance of work nor payment for that work shall constitute a waiver of any provisions of this Contract. A waiver of any breach shall not constitute a waiver of any other provision or subsequent breach.

IN WITNESS WHEREOF, the parties to these presents have hereunto set their hands on the date below written.

#### OWNER

Date

Pete Carr City Manager City of Orland

(City Seal)

Attest:

Jennifer Schmitke, City Clerk, City of Orland

CONT	RAC	TOR
00111		

Date

name

title

Approved as to Form:

company

29

Greg Einhorn, City Attorney City of Orland



Whereas, The City Council of the City of	, 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 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	(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 ou	rselves, our heirs, successors, executors and administrators,
jointly and severally, firmly by these preser	nts.

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 \_\_\_\_\_\_, 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 therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by the 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 thereunder or the specifications accompanying the same shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

31

The surety's obligations to the City arise immediately upon the default of the principal, without demand or notice.

In the event the principal defaults in the performance of its obligations, the surety may elect, either directly or through appropriate contractors to perform in the place of the principal. If the surety elects to proceed in this fashion, it shall provide written notice of such election to the City within thirty (30) days after surety becomes aware of the principal's default. If the surety elects to complete the obligations of the principal (as opposed to paying money damages to the City occasioned by such breach) the surety shall cause the obligations of the principal to the performed as soon as is reasonably possible, but in no event later than nine (9) months following knowledge of the breach by the principal. In the event the surety elects to perform the principal's obligations, the City shall be entitled to compel the surety, by way of specific performance, to perform such obligations.

If the surety does not elect to perform the principals' obligations, the surety shall deposit with the City a sum equal to the cost of the uncompleted portion of the work which comprises the principal's obligation. The City's city engineer shall determine the estimated cost of the uncompleted portion of the work and the surety shall make such deposit with the City within five (5) days of receipt of the city engineer's estimate. The City shall not be required to expend any of its own funds to complete the work nor to incur "out-of-pocket" damages inasmuch as the City's damages are measured by the value of its unfulfilled right, namely the cost of completing the obligations of the principal by installing the bargained-for improvements. Upon deposit of the estimated cost of completion with the City may proceed to bid the remainder of the work as a public project pursuant to the Public Contracts Code and the surety shall be obligated to continue to deposit such additional sums as may be necessary from time-to-time until the improvements are complete and accepted by the City or until the surety has exhausted the penal sum of the bond. Should the surety deposit more funds than are necessary to satisfy the principal's obligation, then the City shall refund any balance remaining upon final acceptance of the improvements. No interest shall be paid on any deposits made with the City.

Underwriting assumptions and cost estimates of the Surety shall not have any bearing, whatsoever, on the Surety's liability under this bond. By way of example, if, when making underwriting decisions regarding issuing this bond, a cost estimate was prepared regarding the principal's obligations to the City, the fact that an item was omitted from the cost estimate (which item was an obligation of the principal to the City), shall in no way defeat or diminish the Surety's obligation to the City with respect to this omitted item. By way of further example, if the underwriting decision to issue this bond included a cost estimate of items and a particular item was estimated at a cost significantly less than the amount actually required to perform such item, this fact shall in no way defeat or diminish the Surety's obligation to the City. Namely, the Surety shall be obligated, to the full amount of the penal sum of the bond, with respect to all matters which are the principal's obligation to the City, whether such items are actually included in any cost

estimate (or if so included, are estimated at a cost far less than the actual cost to perform such items). Likewise, the adequacy and amount of any premium (and whether or not such premium was sufficient for the risk assumed by Surety) shall have no bearing on Surety's absolute and unconditional obligation to the City upon the principal's default of its obligations under this bond.

In witness whereof, this instrument has been duly executed by the principal and surety above named, on

	, 20
ATTEST:	
	Principal
	_
	Ву
(Principal Secretary)	
(Witness as to Principal)	
(Withess as to Fillipal)	(Address)
(Address)	
ATTEST:	
	Surety
	Ву
(Surety Secretary)	Attorney-in-Fact
(Witness as to Surety)	(Address)

33

NOTE: If Contractor is a Partnership, all partners should execute the bond.



Whereas, The City Council of the City of	, State of California,
and	(hereinafter designated as
"principal")	
have entered into an agreement whereby principal agrees to	o install and complete certain designated
public improvements, which said agreement, dated	, 20, and identified
as project	, is hereby referred
to and made a part hereof: and	

to and made a part hereof; and

Whereas, Under the terms of the agreement, the principal is required before entering upon the performance of the work, to file a good and sufficient payment bond with the City of \_\_\_\_\_\_ to secure the claims to which reference is made in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code.

Now, therefore, the principal and the undersigned as corporate surety, are held firmly bound unto the City of \_\_\_\_\_\_ and all contractors, subcontractors, laborers, material suppliers, and other persons employed in the performance of the agreement and referred to in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code 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 this work or labor, that the surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by county (or city) in successfully enforcing this 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 3 (commencing with

Section 9000) of Part 6 of Division 4 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 the 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	
ATTEST:	
	Principal
	Ву
(Principal Secretary)	
(Witness as to Principal)	(Address)
(Address)	
ATTEST:	
	Surety
	Ву
(Surety Secretary)	Attorney-in-Fact
(Witness as to Surety)	(Address)

36

NOTE: If Contractor is a Partnership, all partners should execute the bond
# 1.00 SCOPE OF THE WORK

# 1.01 INTENT

The intent of the Plans and Specifications is to prescribe the details for the construction and completion of the work which the Contractor undertakes to perform in accordance with the terms of the Contract Documents. Where the Plans or Specifications describe portions of the work in general terms, but not in complete detail, it is understood that only the best general practice is to prevail and that only materials and workmanship of the first quality are to be used. Unless otherwise specified, the Contractor shall furnish all labor, materials, tools, equipment, and incidentals, and do all the work involved in executing the Contract in a satisfactory and workmanlike manner.

# 1.02 CHANGES IN THE WORK

The Owner reserves the right to make changes in the work, including alterations, additions, deductions and omissions, and to require extra work, all as may be deemed necessary by the Owner. All such changes will be done under Contract Change Order which shall set forth the work to be done or the changes to be made, the value of the work or the method by which it will be determined and the change, if any, in the time of completion of the work.

The value of any such extra work or change shall be determined in one or more of the following ways:

- (a) By unit prices named in the Contract or subsequently agreed upon.
- (b) By estimate and acceptance in an agreed upon lump sum.
- (c) By Force Account as provided for in Section 6.04.

If none of the above methods is agreed on, or if the work is to be done by Force Account, the Contractor shall keep and present in the form prescribed in Section 6.05 a correct account of the net cost of the labor and materials actually incorporated in the work.

Upon receipt of a Contract Change Order, the Contractor shall proceed with the ordered work. If ordered in writing by the Owner, the Contractor shall proceed with the work so ordered prior to actual receipt of a Contract Change Order. A Contract Change Order executed by the Contractor and approved by the Owner is an executed Contract Change Order as that term is used in Section 1.03 through 1.05.

A Contract Change Order may be issued to the Contractor at any time. Should the Contractor disagree with any terms or conditions set forth in a Contract Change Order which he has not executed, he shall submit a written protest to the Owner within 15 days after the receipt of such Contract Change Order. The protest shall state the points of disagreement, Specification references, and, if possible, the quantities and cost involved. If a written protest is not submitted, payment will be made as set forth in the Contract Change Order and such payment shall constitute full compensation for all work included therein or required thereby. Such unprotested Contract Change Orders will be considered as executed Contract Change Orders as that term is used in Section 1.03 through 1.05.

Where the protest concerning a Contract Change Order relates to compensation, the compensation payable for all work specified or required by said Contract Change Order to which such protest relates will be determined as provided in Section 1.03 through 1.05. The Contractor shall keep full and complete records of the cost of such work and shall permit the Owner to have access thereto as may be necessary to assist in the determination of the compensation payable for such work.

Where the protest concerning a Contract Change Order relates to the adjustment of time of completion of the work, the time to be allowed therefore will be determined as provided in Section 2.03.

# 1.03 INCREASED OR DECREASED QUANTITIES

Increases or decreases in the quantity of a Contract item of work will be determined by comparing the total pay quantity of such item of work with the quantity shown in the Proposal for the same item of work.

If the total pay quantity of any item of work required under the Contract varies from the Proposal quantity therefore by 25 percent or less, payment will be made for the quantity of work performed at the Contract unit price, unless eligible for adjustment pursuant to Section 1.04.

If the total pay quantity of any item of work required under the Contract varies from the Proposal quantity therefore by more than 25 percent, in the absence of an executed Contract Change Order specifying the compensation to be paid, the compensation payable to the Contractor will be determined in accordance with Section 1.03A, 1.03B, or 1.03C herein, as the case may be.

# 1.03A INCREASE OF MORE THAN 25 PERCENT

Should the total pay quantity of any item of work under the Contract exceed the Proposal quantity by more than 25 percent, the work in excess of 125 percent of the Proposal quantity (if not covered by an executed Contract Change Order specifying the compensation) will be paid for by adjusting the Contract unit price, or at the option of the Owner, payment for the work involved in such excess will be made on the basis of Force Account as provided in Section 6.04.

The Contractor's fixed costs which have been distributed over the Proposal quantity will be deemed to have been recovered by the Contractor from the payments made for 125 percent of the Proposal quantity, and will be excluded from the adjusted unit price.

# 1.03B DECREASES OF MORE THAN 25 PERCENT

Should the total pay quantity of any item of work under the Contract be less than 75 percent of the Proposal quantity, the quantity performed (unless covered by an executed Contract Change Order specifying the compensation) will be paid for by adjusting the Contract unit price, or at the option of the Owner, payment for the quantity of the work of such item performed will be made on the basis of Force Account as provided in Section 6.04.

The Contractor's fixed costs which have been distributed over the Proposal quantity will be redistributed over the pay quantity in determining the adjusted unit price.

The total payment for the final quantity of such item of work will in no case exceed the payment which would be made for the performance of 75 percent of the Proposal quantity at the original Contract unit price.

## 1.03C DELETED ITEMS

Should any Contract item of work be deleted in its entirety (in the absence of an executed Contract Change Order covering the deletion), payment will be made to the Contractor for actual and direct costs, excluding overhead and profit, incurred prior to the date of notification in writing by the Owner of the deletion, except as provided for costs of handling materials.

If acceptable material is ordered by the Contractor for the deleted item prior to the date of notification of the deletion by the Owner, and if orders for such material cannot be canceled, it will be paid for at the actual cost to the Contractor, excluding overhead and profit. In such case, the material paid for shall become the property of the Owner and the cost of any further handling will be paid for as extra work as provided in Section 1.05. If the material is returnable to the vendor and if the Owner so directs, the material shall be returned and the Contractor will be paid for charges made by the vendor for returning the material, excluding any markup for overhead and profit to the Contractor. The cost of handling returned material will be paid for as extra work as provided in Section 1.05.

## 1.04 CHANGES IN CHARACTER OF WORK

If an ordered change in the Plans or Specifications materially changes the character of the work of a Contract item from that on which the Contractor based his Proposal price, and increases or decreases the actual unit cost of the changed item, an adjustment in compensation therefore will be made. Any such adjustment will apply only to the portion of the work of said item actually changed in character. At the

option of the Owner, the work of said item or portion of said item which is changed in character will be paid for by Force Account as provided in Section 6.04.

Failure of the Owner to recognize a change in character of the work at the time the Contract Change Order is issued shall in no way be construed as relieving the Contractor of his duty and responsibility of filing a written protest within the 15-day limit.

# 1.05 HAZARDOUS MATERIALS

Contracts for excavations deeper than four feet are subject to the provisions of Public Contracts Code Section 7104, which addresses the discovery of hazardous materials in connection with any excavation which may be required. That section provides:

**1.05A** That the Contractor shall promptly, and before the following conditions are disturbed, notify the Owner, in writing, of any:

**1.05A(1)** Material that the Contractor believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II, or Class III disposal site in accordance with provisions of existing law.

**1.05A(2)** Subsurface or latent physical conditions at the site differing from those indicated.

**1.05A(3)** Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract.

**1.05B** That the Owner 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 the time required for, performance of any part of the work shall issue a Contract Change Order under the procedures described in the Contract.

**1.05C** That, in the event that a dispute arises between the Owner and the Contractor whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the Contractor's cost of, or time required for, performance of any part of the work, the Contractor shall not be excused from any scheduled completion date provided for by the Contract, but shall proceed with all work to be performed under the Contract. The Contractor shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

# 1.06 EXTRA WORK

New and unforeseen work will be classed as extra work when determined by the Owner that such work is not covered by any of the various items for which there is a Contract price or by combinations of such items. In the event portions of such work are determined by the Owner to be covered by some of the various items for which there is a Contract price or combination of such items, the remaining portion of such work will be classed as extra work. Extra work also includes work specifically designated as extra work in the Plans or Specifications.

The Contractor shall do such extra work and furnish material and equipment therefore upon receipt of a Contract Change Order or other written order from the Owner, and without a Contract Change Order or other written order of the Owner, he shall not be entitled to payment for such extra work. Where such extra work is ordered by a written order other than a Contract Change Order, the Owner will, as soon as practicable, issue a Contract Change Order. The provisions in Section 1.02 shall be fully applicable to the subsequently issued Contract Change Order. Payment for extra work required to be performed pursuant to the provisions of this section, in the absence of an executed Contract Change Order, will be made by Force Account as provided in Section 6.04, or as agreed to by the Contractor and the Owner.

## 1.07 GUARANTEE

The Contractor shall guarantee all of his work against defective material or faulty workmanship for a period of one year after the date of acceptance of the work by the Owner.

The Contractor shall repair or replace to the satisfaction of the Owner any or all such work that may prove defective in workmanship or materials within that period, ordinary wear and tear and unusual abuse or neglect excepted, together with any other work which may be damaged or displaced in so doing.

In the event of failure to comply with the above-mentioned conditions within a reasonable time after being notified in writing, the Owner is authorized to have the defects repaired and made good at the expense of the Contractor who will pay the cost and charges therefore immediately upon demand.

The signing of the Contract by the Contractor shall constitute execution of the above guarantees. The Contract Performance Bond shall remain in full effect during the guarantee period and will not be released until the expiration of such period.

## 2.00 PROGRESS AND COMPLETION OF THE WORK

#### 2.01 PROGRESS OF THE WORK AND TIME OF COMPLETION

The Contractor shall begin work within 15 days after the issuance of the Notice to Proceed by the Owner. He shall diligently prosecute the same to completion within the number of days set forth in the Special Conditions.

## 2.02 LIQUIDATED DAMAGES

It is agreed by the parties of the Contract that in case all work called for under the Contract is not completed within the number of days specified in the Special Conditions, damage will be sustained by the Owner; and it is further agreed that it is, and will be, impractical and extremely difficult to ascertain and determine the actual damage which the Owner will sustain by the delay. It is therefore agreed that the Contractor will pay to the Owner the sum specified in the Special Conditions for each and every day's delay in finishing the work. The Contractor agrees to pay said liquidated damages and further agrees that the Owner may deduct the amount thereof from the monies due or to become due the Contractor under this Contract.

It is further agreed that if the work called for under the Contract is not completed within the number of days specified in the Special Conditions, the Owner shall have the right to increase the number of days or not, as he decides will best serve his interest. If the Owner decides to increase the number of days, he shall further have the right to charge the Contractor, his heirs, assigns, or sureties, and to deduct from the final payment for the work, all or any part, as he 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 such extension, except that the cost of final surveys and preparation of the final estimate shall not be included in such charges.

## 2.03 DELAYS AND EXTENSIONS OF TIME

The Contractor will be granted an extension of time and will not be assessed with liquidated damages or the cost of engineering, inspection, superintendence and other overhead expenses during any delay beyond the time named for the completion of the work caused by an act of God or by the public enemy, acts of the Owner, fire, floods, epidemics, quarantine restrictions, strikes, unusual shortage of materials and freight embargoes. In the event of such delay, the Contractor shall notify the Owner in writing of the causes of delay within 10 days from the beginning of such delay, and his findings thereon shall be final.

## 2.04 PROGRESS SCHEDULE AND ORDER OF COMPLETION

Within 10 days after execution of the Contract, the Contractor shall submit to the Owner a progress schedule showing a breakdown of the work into at least all of its major items, and showing the proposed dates of starting and completing these items of work. This schedule shall also conform to the requirements for completion of portions of the work as may be specified in the Special Conditions. The

Contractor shall review and, if necessary, revise the progress schedule at least once a month and in any event shall submit a current schedule to the Owner at his request at any time during the Contract period.

# 3.00 CONTROL OF THE WORK

# 3.01 ASSIGNMENT

Neither party of the Contract shall assign the Contract or sublet it as a whole without the written consent of the other, nor shall the Contractor assign any monies due, or to become due to him hereunder, without the previous written consent of the Owner.

# 3.01A ANTITRUST CLAIMS ASSIGNMENT

To the extent this Contract constitutes a contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or subcontractor offers and agrees to assign to the Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act (15 U.S.C. Section 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 or the subcontract. This assignment is made and becomes effective at the time the Owner tenders final payment to the Contractor, without further acknowledgment by the parties.

# 3.02 RIGHTS OF VARIOUS INTERESTS

Wherever work being done by the Owner's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Owner, to secure the completion of the various portions of the work in general harmony.

# 3.03 SEPARATE CONTRACTS

The Owner reserves the right to let other contracts in connection with this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

If any part of the Contractor's work depends upon the work of any other contractor, the Contractor shall inspect and promptly report to the Owner any defects in such work that render it unsuitable. His failure to so inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of his work except as to defects which may later develop in the other contractor's work. In addition, the Contractor shall measure work already in place and shall immediately report to the Owner any discrepancy between the executed work and that shown on the Plans.

# 3.04 SUBCONTRACTS

No subcontractor will be recognized as such, and all persons engaged in the work will be considered as employees of the Contractor and he will be held responsible for their work, which shall be subject to the provisions of the Contract Documents. Nothing contained in the Contract Documents shall create any contractual relation between any subcontractor and the Owner.

## 3.05 CONTRACT DOCUMENTS

The various parts of the Contract Documents, as defined in the Instructions to Bidders, are complementary and a requirement stated in one is as binding as though stated in all. They are intended to be cooperative and to describe and provide for a complete work.

In the event of conflict between the Instructions to Bidders and the Special Conditions, the Special Conditions shall govern. In the event of conflict between the General Conditions and the Special Conditions, the Special Conditions shall govern. In the event of conflict between the Plans and the Technical Specifications, the Technical Specifications shall govern, except that where items are shown on the Plans and are not specifically included in the Technical Specifications, the Plans shall govern.

41

## 3.06 CITY ENGINEER'S AUTHORITY

The City Engineer is the representative of the Owner and has full authority to interpret the Contract Documents, to enforce the requirements thereof and to decide questions which arise during the course of the work. He has authority to stop the work whenever such stoppage may be necessary to insure the proper execution of the Contract. He shall also have authority to reject all work and materials which do not conform to the Contract Documents.

If at any time before the commencement or during the progress of the work, tools, plant or equipment appear to the City Engineer to be insufficient, inefficient, or inappropriate to secure the quality of work required or the proper rate of progress, the City Engineer may order the Contractor to increase their efficiency, or to improve their character, or to augment their number, or to substitute new tools, plant or equipment as the case may be, and the Contractor must conform to such order; but the failure of the City Engineer to demand such increase of efficiency, number, or improvement shall not relieve the Contractor of his obligation to secure the quality of work and the rate of progress necessary to complete the work in accordance with the Contract Documents.

In giving instructions, the City Engineer shall have authority to make minor changes in the work, not involving extra cost, and not inconsistent with the purpose of the work.

# 3.07 INSPECTION OF WORK

The Owner shall at all times have access to the work wherever it is in preparation or progress and the Contractor shall provide proper facilities for such access and for inspection. If the Specifications or the Engineer's instructions require any work to be specially tested or approved, the Contractor shall give the Owner a minimum of 48 hours' notice of its readiness for inspection. Inspection by the Owner will be made promptly. If any work should be covered up without approval or consent of the Owner, it must, if required by the Owner, be uncovered for examination at the Contractor's expense.

The inspection of the work or materials shall not relieve the Contractor of any of his obligations to fulfill his Contract as prescribed. Work and materials not meeting such requirements shall be made good and unsuitable work or materials may be rejected, notwithstanding that such work or materials may have been previously inspected by the Owner or that payment therefore has been included in a progress estimate.

Re-examination of questioned work may be ordered by the Owner and if so ordered, the work must be uncovered by the Contractor. If such work is found to be in accordance with the Contract Documents, the Owner will pay the cost of re-examination and replacement. If such work is not found to be in accordance with the Contract Documents, the Contractor shall pay such cost.

Projects financed in whole or in part with State or federal funds shall be subject to inspection at all times by the State or federal agency involved. Where any part of the work is being done under an encroachment permit or building permit, or is subject to State, County or municipal codes, laws or ordinances, representatives of the governing agency shall have full access to the work and shall be allowed to make any inspection or tests in accordance with such permits, codes, laws or ordinances. If advance notice of the readiness of the work for inspection by the governing agency is required, the Contractor shall furnish such notice to the appropriate agency.

## 3.08 SUPERINTENDENCE

The Contractor shall designate in writing before starting work, an authorized representative who shall have complete authority to represent and to act for the Contractor. Said authorized representative shall be present at the site of the work at all times while work is actually in progress on the Contract. During periods when work is suspended, arrangements acceptable to the Owner shall be made for any emergency work which may be required.

Whenever the Contractor or his authorized representative is not present on any particular part of the work where it may be desired to give direction, orders will be given by the Owner, which shall be received and

obeyed by the superintendent or foreman who may have charge of the particular work in reference to which the orders are given.

Any order given by the Owner, not otherwise required by the Contract Documents to be in writing will, on request of the Contractor, be given or confirmed by the Owner in writing.

# 3.09 CHARACTER OF WORKMEN

If any subcontractor or person employed by the Contractor shall fail or refuse to carry out the directions of the Owner or shall appear to the Owner to be incompetent or to act in a disorderly or improper manner, he shall be removed immediately on the requisition of the Owner, and such person shall not again be employed on the work.

The Contractor shall at all times enforce strict discipline and good order among his employees, and shall not employ on the work any unfit person or anyone not skilled in the work assigned to him.

Neither party shall employ or hire any employee of the other party without his consent.

# 3.10 PLANS, SPECIFICATIONS AND INSTRUCTIONS

Unless otherwise provided in the Special Conditions, the Owner will furnish to the Contractor, free of charge, all copies of Plans and Specifications reasonably necessary for the execution of the work. He will also furnish with reasonable promptness additional instructions, either as supplemental drawings or otherwise, as may be necessary for the proper execution of the work. The Contractor shall keep one copy of all Plans and Specifications, including any Addenda and Contract Change Orders, on the work in good order available to the Owner and his representatives.

Should the Contractor be in doubt as to the meaning of any provision in the Plans and Specifications, or should he find any errors or omissions therein, or should he find any errors or omissions in the layout or staking, he shall immediately notify the Owner. The Owner will promptly investigate and will furnish the Contractor with any additional instructions as may be required.

Unless otherwise noted in the Special Conditions, upon completion of all Contract work, the Contractor shall provide the Owner with one complete set of Plans and Specifications with all "As Built" changes or modifications marked and annotated.

## 3.11 CONSTRUCTION STAKING

Unless otherwise noted in the Special Conditions, the Owner will set such construction stakes and marks as he determines are necessary to establish the lines and grades required for the completion of the work specified in the Contract Documents. Whenever the Contractor requires construction stakes, he shall notify the Owner of his requirements at least five days in advance of starting operations that require such stakes.

Property corners, bench marks, reference points and stakes shall be carefully preserved by the Contractor. In case such stakes or marks are destroyed or damaged, they will be replaced at the Owner's earliest convenience. The Contractor shall be charged for the cost of replacing or restoring stakes and marks which are destroyed or damaged by his operations. This charge will be deducted from any monies due or to become due to the Contractor under the Contract.

# 3.12 PERMITS AND REGULATIONS

Permits and licenses of a temporary nature necessary for the prosecution of the work shall be obtained by the Contractor at his expense. Unless otherwise specified in the Special Conditions, permits and licenses for permanent structures or permanent changes in existing facilities will be secured and paid for by the Owner. Copies of any permits and licenses which are obtained by the Owner will be on file at his office and will be available for inspection by the Contractor. The Contractor shall acquaint himself with, and abide by, any requirements of these documents. The Contractor shall obtain any supplemental agreements or bonds required by any encroachment permit, and he shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work. If the Contractor observes that the Plans and Specifications are at variance therewith, he shall promptly notify the Owner in writing, and any necessary changes shall be adjusted as provided in the Contract Documents for changes in the work. If the Contractor performs any work, knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Owner, he shall bear all costs arising therefrom.

# 3.13 LANDS FOR WORK

The Owner and County shall provide the lands, easements and rights-of-way upon which the work under this Contract is to be done. Unless he specifically makes other arrangements, the Contractor shall confine his operations to the limits of the Owner's and County's land and to the limits of the easements and rights-of-way. The Contractor shall provide land required for the erection of temporary construction facilities and storage of his material. The Contractor is advised that if additional working space is required outside the limits of the rights-of-way provided, such additional area must be obtained directly from the property owners by the Contractor for use during the construction period. The Owner and County shall be furnished with copies of <u>written</u> agreements or otherwise notified <u>in writing</u> if additional working space is acquired.

The County shall be included in the decision-making process for any work-related decisions and/or deviations to the plans and these specifications for any work conducted within County lands, easements, and rights-of way.

# 3.14 SUSPENSION OF WORK

The Owner may at any time suspend the work, or any part thereof, by giving one day's notice to the Contractor in writing. The work shall be resumed by the Contractor within 10 days after the date fixed in the written notice from the Owner to the Contractor to do so. The Owner will reimburse the Contractor for expense incurred by the Contractor in connection with the work under this Contract as a result of such suspension, except that no reimbursement will be made if the suspension is due to non-conformance with the Contract Documents on the part of the Contractor. If the work or any part thereof shall be stopped by notice in writing, and if the Owner does not give notice in writing to the Contractor to resume work within 30 days of the date fixed in written notice to suspend, the Contractor may abandon the suspended portion of the work and will be entitled to payment for all work acceptably done on the abandoned portions.

# 3.15 THE OWNER'S RIGHT TO DO WORK

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of the Contract, the Owner, after 3 days' written notice to the Contractor, may, without prejudice to any other course of action he may have, perform or have performed by other forces, all or any portion of the work and may deduct the cost thereof from the monies due or to become due the Contractor under this Contract.

# 3.16 THE OWNER'S RIGHT TO TERMINATE CONTRACT

If the Contractor should be adjudged bankrupt, or should make a general assignment for the benefit of his creditors, or if a receiver should be appointed because of his insolvency, or if he should persistently or repeatedly refuse or should fail to supply enough properly skilled workmen or proper materials, or if he should fail to make prompt payment to subcontractors or for materials or labor, or persistently disregard laws, ordinances or the instructions of the Owner, or otherwise be guilty of a substantial violation of any provision of the Contract, then the Owner, may, without prejudice to any other right or remedy and after giving the Contractor 7 day's written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools, and appliances thereon and finish the work by whatever method he may deem expedient. In such case, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price exceeds the expenses of finishing the work, including compensation for all attributable administrative costs and for damages incurred through the Contractor's default, such excess shall be paid to the Contractor. If such expenses exceed such unpaid balance, the Contractor shall pay the difference to the Owner. The

expenses incurred by the Owner as herein provided, and the damage incurred through the Contractor's default, shall be certified by the Owner.

# 3.17 REMOVAL OF EQUIPMENT

In the case of annulment of this Contract before completion for any cause, the Contractor, if notified to do so by the Owner, shall promptly remove any part or all of his equipment and supplies from the Owner's property. If not promptly done, the Owner shall have the right to remove such equipment and supplies at the expense of the Contractor.

# 3.18 CORRECTION OF WORK

The Contractor shall promptly remove from the premises all materials condemned by the Owner as failing to conform to the Contract Documents whether incorporated in the work or not. The Contractor shall, at his own expense, promptly replace such materials and perform all work made necessary by such replacement, including making good all work of others destroyed or damaged by such removal or replacement.

If the Contractor does not remove such condemned work and materials within a reasonable time, fixed by written notice, the Owner may remove and store the material at the expense of the Contractor. If the Contractor does not pay for the expense of the removal within 10 days' time thereafter, the Owner may, upon 10 days' written notice, sell such materials at auction or at private sales and shall account for the net proceeds thereof, after deducting all the costs and expenses that should have been borne by the Contractor.

# 3.19 DEDUCTIONS FOR UNCORRECTED WORK

If the Owner deems it inexpedient to correct work injured or done not in accordance with the Contract, an equitable deduction from the Contract price shall be made therefore.

# 3.20 USE OF COMPLETED PORTIONS

The Owner shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding the time for completing the entire work or such portions may not have expired, but taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the work, the Contractor shall be entitled to extra compensation, or extension of time or both, as the Owner may determine.

## 3.21 CONTRACTOR CLAIMS

Appropriate claims shall be submitted and reviewed in accordance with Section 20104 of the Public Contracts Code. For any claim subject to this Section, the following requirements apply:

**3.21A** The claim shall be in writing and include the documents necessary to substantiate the claim. Claims must be filed on or before the date of final payment. Nothing in this subdivision is intended to extend the time limit or supersede notice requirements otherwise provided in the Contract for the filing of claims.

**3.21B(1)** For claims of less than fifty thousand dollars (\$50,000), the Owner shall respond in writing to any written claim within 45 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the Owner may have against the Contractor.

**3.21B(2)** If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the Owner and the Contractor.

**3.21B(3)** The Owner's written response to the claim, as further documented, shall be submitted to the Contractor within 15 days after receipt of the further documentation or within a period of time no greater than that taken by the Contractor in producing the additional information, whichever is greater.

**3.21C(1)** For claims of over fifty thousand dollars (\$50,000) and less than or equal to three hundred seventy-five thousand dollars (\$375,000), the Owner shall respond in writing to all written claims within 60 days of receipt of the claim, or may request, in writing, within 30 days of receipt of the claim, any additional documentation supporting the claim or relating to defenses to the claim the Owner may have against the Contractor.

**3.21C(2)** If additional information is thereafter required, it shall be requested and provided pursuant to this subdivision, upon mutual agreement of the Owner and the Contractor.

**3.21C(3)** The Owner's written response to the claim, as further documented, shall be submitted to the Contractor within 30 days after receipt of the further documentation, or within a period of time no greater than that taken by the Contractor in producing the additional information or requested documentation, whichever is greater.

**3.21D** If the Contractor disputes the Owner's written response, or the Owner fails to respond within the time prescribed, the Contractor may so notify the Owner, in writing, either within 15 days of receipt of the Owner's response or within 15 days of the Owner's failure to respond within the time prescribed, respectively, and demand an informal conference to meet and confer for settlement of the issues in dispute. Upon a demand, the Owner shall schedule a meet and confer conference within 30 days for settlement of the dispute.

**3.21E** Following the meet and confer conference, if the claim or any portion remains in dispute, the Contractor may file a claim as provided in Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code. For purposes of those provisions, the running of the period of time within which a claim must be filed shall be tolled from the time the Contractor submits his or her written claim pursuant to subdivision (a) until the time that claim is denied as a result of the meet and confer process, including any period of time utilized by the meet and confer process.

**3.21F** This article does not apply to tort claims and nothing in this article is intended nor shall be construed to change the time periods for filing tort claims or actions specified by Chapter 1 (commencing with Section 900) and Chapter 2 (commencing with Section 910) of Part 3 of Division 3.6 of Title 1 of the Government Code.

It is hereby mutually agreed that the Contractor shall not be entitled to payment of additional compensation for any cause, including any act or failure to act by the Owner, or of any event, thing or occurrence, unless he shall have given the Owner due written notice of potential claim, provided however, that compliance with this Section shall not be a prerequisite as to matters within the scope of the protest provisions in Section 1.02, nor to any claim which is based on differences in measurements or errors of computation of Contract quantities.

The written notice of potential claim shall set forth the reasons 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 required notice must have been given to the Owner prior to the time the Contractor performed the work giving rise to the potential claim for additional compensation, if based on an act or failure to act by the Owner, or in all other cases within 15 days after the event, thing or occurrence giving rise to the potential claim.

In the event of an emergency endangering life or property, the Contractor shall act as stated in Section 4.04, and after execution of the emergency work, shall present an accounting of labor, materials, and

equipment in connection therewith. The procedure for any payment that may be due for emergency work will be as specified in Section 1.02.

The City Engineer shall, within a reasonable time after their presentation to him, state his decisions in writing on all claims of the Owner or the Contractor. All such decisions of the City Engineer shall be final.

It is the intention of this Section that differences between the parties arising under and by virtue of the Contract be brought to the attention of the City Engineer at the earliest possible time so 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 act, failure to act, event, thing or occurrence for which no written notice of potential claim was filed.

# 3.22 CLEANING UP

The work area shall be kept in a neat and orderly condition during construction. The Contractor shall remove and dispose of all trash, debris and waste material resulting from his operations. The Contractor shall, at his own expense, promptly remove from the Owner's property, and from all other lands affected by his work, all temporary structures, rubbish and waste materials resulting from his operations. He shall leave such lands in a neat and orderly condition which is at least as good as the condition prior to his operations.

## 4.00 INSURANCE AND LIABILITY

## 4.01 CONTRACTOR'S LIABILITY INSURANCE

The Contractor shall maintain insurance to protect him from claims under workman's compensation acts and from any other claims for damages for personal injury, including death, which may arise from operations under this Contract, whether such operations are controlled by him, a subcontractor or by anyone directly or indirectly employed by either of them. The Owner and County shall be named as coinsured in all such insurance policies and the coverage shall include concurrent negligence of the Owner and County or their agents, employees, or representatives whether such concurrent negligence be active or passive, including specifically any liability based upon a violation of any non-delegable duties. Certificates of insurance and the certificate required by Labor Code Section 1861 shall be filed with the Owner and County prior to commencing the work and shall be subject to their approval for adequacy of protection.

The Contractor specifically obligates himself and hereby agrees to protect, hold free and harmless, defend and indemnify the Owner, the Engineer and his consultants, and each of their officers, employees and agents, from any and all liability, penalties, costs, losses, damages, expenses, causes of actions, claims or judgments, including attorney's fees, which arise out of or are in any way connected with the Contractor's performance of his work under this Contract. To the extent legally permissible, this indemnity and hold harmless agreement by the Contractor shall apply to any acts or omissions, whether active or passive, on the part of the Contractor or his agents, employees, representatives, or subcontractors, or his subcontractor's agents, employees and representatives, resulting in liability irrespective of whether or not any acts or omissions of the parties to be indemnified hereunder may have also been a contributing factor to the liability.

As a further precaution toward this end, the Contractor shall procure and maintain, in full force and effect during the performance of the work contemplated thereunder, insurance in his favor and also in favor of the Owner, with an insurance carrier approved by the Owner, as follows:

Liability for Personal Injury or Property Damage in the amount of \$1,000,000.00 for any occurrence.

The Contractor shall, before the commencement of the work, take out and maintain in full force and effect, compensation insurance with an insurance carrier or carriers under an insurance policy or policies, satisfactory to the Owner covering his full liability under the "Worker's Compensation Insurance and

Safety Act" of the State of California to any employee who may be injured during the course of said work and to the dependents of any employee who may be killed during the course of said work.

Such policy or policies shall expressly provide therein that they shall not be canceled by the insurer until 10 days after written notice of the intended cancellation thereof shall have first been given to the Owner by the insurer.

The Contractor shall file with the Owner, immediately after the signing of the Contract, certificates of all insurance. These certificates shall be fully executed and shall state that the policies cannot be canceled until 10 days after written notification of such intent of cancellation has been given to the Owner. All policies shall be with Insurance Companies acceptable to the Owner.

In case of the breach of any provision of this Section, the Owner may take out and maintain at the expense of the Contractor such insurance as the Owner may deem proper and may deduct the cost of such insurance from any monies which may be due or become due the Contractor under this Contract.

# 4.02 FIRE INSURANCE

Fire Insurance is <u>not</u> required for this project.

# 4.03 PRESERVATION OF PROPERTY

The Contractor shall take whatever precautions necessary to prevent damage to all existing improvements, including aboveground and underground utilities, trees and shrubbery that are not specifically shown to be removed, fences, signs, mail boxes, survey markers and monuments, building and structures, the Owner's property, adjacent property and any other improvements or facilities within or adjacent to the work. If such improvements or property are injured or damaged by the Contractor's operations, they shall be replaced or restored, at the Contractor's expense, to a condition at least as good as the condition prior to the start of the Contractor's operations.

The Contractor shall examine all bridges, culverts, and other structures over which he will move his materials and equipment, and before using them, he shall properly strengthen such structures, where necessary. The Contractor will be held responsible for any and all injury or damage to such structures caused by his operations.

The fact that any pipe or other underground facility is not shown, or not accurately shown on the Plans, shall not relieve the Contractor of his responsibility under this Section. It shall be the Contractor's responsibility to ascertain the existence of any underground improvements or facilities which may be subject to damage by his operations.

# 4.04 PROTECTION OF WORK

The Contractor shall continuously maintain adequate protection of all his work from damage. He shall make good any such damage, injury or loss, except as may be directly due to errors in the Contract Documents or caused by agents or employees of the Owner. He shall adequately protect adjacent property as provided by law and the Contract Documents. He shall provide and maintain all passage-ways, guard fences, lights and other facilities for protection required by public authority or local conditions.

In an emergency affecting the safety of life or of the work or of adjoining property, the Contractor, without special instruction or authorization from the Owner, is hereby permitted to act at his discretion to prevent such threatened loss or injury, and he shall so act without appeal if so instructed or authorized. Any compensation claimed by the Contractor for emergency work shall be determined as specified under Section 1.02.

## 4.05 PUBLIC SAFETY

The Contractor shall be responsible for furnishing and maintaining all flagmen, warning signs, barricades, emergency lighting, shoring, etc. necessary to protect the public and workmen employed on the project. Safety provisions shall conform to all applicable federal, State, County and local laws, ordinances and codes and, in particular, to the rules and regulations established by OSHA, the California Division of Industrial Safety, and the California Manual on Uniform Traffic Control Devices.

# 4.06 ACCIDENTS

The Contractor shall provide at the site such equipment and medical facilities as are necessary to give first-aid service to anyone who may be injured.

The Contractor must promptly report in writing to the Owner all accidents arising from or in connection with the performance of the work on or adjacent to the site, giving full details and statements of witnesses. If death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to both the City Engineer and the Owner.

If any claim is made against the Contractor or any subcontractor because of any accident, the Contractor shall promptly report the facts in writing to the Owner, giving full details of the claim.

# 5.00 LABOR AND MATERIALS

# 5.01 HOURS OF LABOR

The Contractor shall forfeit, as penalty to the Owner, \$25.00 for each workman employed in the execution of the Contract by him, or by any subcontractor under him, for each calendar day any workman is required or permitted to labor more than 8 hours in violation of the provisions of the Labor Code and in particular, Section 1810 to Section 1817 thereof, inclusive.

# 5.02 EMPLOYMENT OF APPRENTICES

The Contractor's attention is directed to Section 1777.5 of the Labor Code; provisions of said section pertaining to employment of indentured apprentices are hereby incorporated by reference into these Specifications. As applicable, the Contractor or any subcontractor employed by him in the performance of the Contract work shall take such actions as necessary to comply with the provisions of said Section 1777.5.

## 5.03 LABOR 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, color or religion of such persons and every contractor for public works violating this section is subject to all the penalties imposed for a violation of this chapter."

## 5.04 PREVAILING WAGE

The Contractor shall forfeit as penalty to the Owner, \$50.00 for each calendar day or portion thereof, for each workman paid less than stipulated prevailing rates for any work done under the Contract by him or by any subcontractor under him, in violation of the provisions of the Labor Code and in particular, Section 1770 to Section 1780 thereof, inclusive.

The Owner will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the Prevailing Wages set forth in the Contract Documents. The possibility of wage increases is one of the elements to be considered by the Contractor in determining his Bid, and will not be considered as the basis of a claim against the Owner on the Contract.

The Contractor and each Subcontractor shall keep an accurate 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 by him or her in

connection with the work. These payroll records shall be certified and made available for inspection at all reasonable hours at the principal office of the Contractor and furnished by the Contractor to the Owner and others upon request in accordance with the provisions of Labor Code Section 1776. The Contractor's attention is called to the penalties provided for in Section 1776 for the failure to comply with its provisions.

# 5.05 MATERIALS

Unless otherwise specifically stated in the Special Conditions, the Contractor shall furnish all materials necessary for the execution and completion of the work. Unless otherwise specified, all materials shall be new and shall be manufactured, handled and installed in a workmanlike manner to ensure completion of the work in accordance with the Contract Documents. The Contractor shall furnish satisfactory evidence as to the kind and quality of materials.

Where materials are to be furnished by the Owner, the type, size, quantity and location at which they are available will be stated in the Special Conditions.

In certain instances, the Owner may have available power, water or other utilities or materials which the Contractor may wish to use. If the Owner intends to furnish these free of charge, it will be so stated in the Special Conditions. In the absence of such specific statement, the Contractor shall furnish all utilities and materials at his own expense.

# 5.06 RECORDS OF MATERIALS PURCHASED

If required by the Owner, the Contractor shall furnish duplicate invoices to the Owner for all materials furnished to the project.

# 5.07 PATENTS

The Contractor shall assume all costs arising from the use of patented materials, equipment, devices, or processes used on or incorporated in the work, and agrees to indemnify and save harmless the Owner and the Engineer from all suits at law, or actions of every nature for, or because of the use of any patented materials, equipment, devices, or processes.

## 5.08 OWNERSHIP OF REMOVED MATERIALS

Unless otherwise specifically stated in the Special Conditions or Technical Specifications, any existing equipment or material removed by the Contractor during the course of the work shall remain the property of the Contractor.

# 5.09 SUBSTITUTION OF MATERIALS

Where materials and equipment are specified in the Technical Specifications or are shown on the Plans as similar and equal to a certain proprietary brand, the intent is to establish the minimum quality and performance acceptable. If the Contractor proposes to substitute materials or equipment of another proprietary brand but of equal quality, he may submit a request to the Engineer for approval of the proposed substitution. No substitution may be made without prior approval and the Engineer shall be the final judge of equality.

If any tests are necessary for evaluation of the proposed substitution by the Engineer, the Contractor shall furnish all necessary test materials and shall pay the cost of the tests.

# 5.10 SHOP DRAWINGS AND MATERIAL DATA

Unless otherwise specifically stated in the Special Conditions or Technical Specifications, the Contractor shall submit a minimum of four separately bound copies of shop drawings and material data to the City Engineer for approval. A complete submittal shall include all drawings and data sheets for all bid item materials and all necessary appurtenances to provide a complete installation of each material. These drawings shall show any necessary details in fabrication or erection, which are not shown on the Plans furnished by the Owner and shall verify details and dimensions of equipment. **Facsimile submittals will not be accepted.** Material and/or equipment shall not be fabricated, assembled, or shipped until the

50

shop drawings or material data have been approved by the City Engineer. The Contractor shall verify these dimensions before starting any work dependent on or affected by them.

The City Engineer will retain three copies of the shop drawings and material data, and will return one copy to the Contractor. If the Contractor desires additional copies, more than four copies must be submitted.

# 5.11 TESTS

Unless otherwise specified in the Special Conditions, the Owner will pay for the required testing of materials. The Contractor will furnish all samples at no cost to the Owner. In the event samples are submitted which fail to pass the specified tests, the Contractor will pay for all subsequent tests. The cost of such re-testing will be deducted from payments due the Contractor.

# 6.00 MEASUREMENT AND PAYMENT

# 6.01 MEASUREMENT OF QUANTITIES

Where the Contract provides for payment on a lump sum price basis, no measurement of quantities will be made. Where the Contract provides for payment on a unit price basis, the quantities of work performed will be computed by the Owner on the basis of measurements taken by the Owner, and these measurements shall be final and binding.

All work computed under the Contract shall be measured by the Owner according to United States Measurements and Weights. Methods of measurement are specified in the Special Conditions and in the Technical Specifications.

# 6.02 SCOPE OF PAYMENT

The Contractor shall accept the compensation, as full payment for furnishing all labor, materials, tools, equipment, and incidentals necessary to the completed work and for performing all work contemplated and embraced under the Contract; also for loss or damage arising from the nature of the work, from the action of the elements, or from any unforeseen difficulties which may be encountered during the prosecution of the work until the acceptance by the Owner and for all risks of every description connected with the prosecution of the work, also for all expenses incurred in consequence of the suspension or discontinuance of the work; and for completing the work according to the Contract Documents. Neither the payment of any estimate nor any retained percentage shall relieve the Contractor of any obligation to make good any defective work or material.

No compensation will be made for loss of anticipated profits. Increased or decreased work involving supplemental agreements will be paid for as provided in such agreements.

# 6.03 CHANGES IN THE WORK

The value of changes in the work, including extra work, shall be determined in accordance with Section 1.02 through 1.05.

# 6.04 FORCE ACCOUNT PAYMENT

Where work is to be paid for by Force Account, the Contractor shall be paid on the basis of the actual cost of labor, material, and equipment, furnished by him as shown on paid vouchers, plus 15 percent. However, the Owner reserves the right to furnish such materials and equipment as he deems expedient, and the Contractor shall have no claim for overhead and profit on the cost or such material and equipment.

The cost of labor as referred to above shall include the cost of the base wages paid to workmen, plus any additional payment paid to, or on behalf of, workmen as required by State or federal laws plus any benefits, subsistence and travel allowance as may be required by collective bargaining agreements.

The cost of material as referred to above shall be the net cost to the purchaser, whether Contractor, subcontractor or other forces, from the supplier thereof.

The cost of equipment as referred to above, shall conform to current equipment rental rates as determined by the California State Transportation Agency's Department of Transportation, Division of Construction. This applies to both rental equipment and equipment owned by the Contractor.

# 6.05 RECORDS OF FORCE ACCOUNT WORK

The Contractor shall maintain his records in a manner 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. The Contractor shall furnish the Owner report sheets in duplicate of each day's extra work no later than the working day following the performance of the work. The daily report sheets 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. The daily report sheets 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 report sheets, or if not available, they shall be submitted with subsequent daily report sheets. Should vendor's invoices not be submitted within 15 days after acceptance of the work, the Owner reserves the right to establish the cost of such material at the lowest current wholesale prices at which the materials are available in the quantities concerned delivered to the location of the work.

Said daily report sheets shall be signed by the Contractor or his authorized agent.

The Owner will compare his records with the daily report sheets furnished by the Contractor, make any necessary adjustments, and compile the costs of work paid for on a Force Account basis on daily extra work report forms. When these daily extra work reports are agreed upon and signed by both parties, they shall become the basis of payment for the work performed.

# 6.06 PAYMENTS WITHHELD

The Owner may withhold or, because of subsequently discovered evidence, nullify the whole or a part of any payment to such extent as may be necessary to protect himself from loss due to:

- a. Defective work not remedied.
- b. Claims filed or reasonable evidence indicating probable filing of claims.
- c. Failure of the Contractor to make payments properly to subcontractors or for material or labor.
- d. A reasonable doubt that the Contract can be completed for the balance then unpaid.
- e. Damage to another Contractor.

When the above grounds are removed, payment shall be made for amounts withheld because of them.

The Contractor may, in accordance with the provisions of Public Contracts Code Section 22300, substitute securities for any monies which the Owner may withhold to insure performance under this Contract.

# 6.07 PROGRESS PAYMENTS

Once each month, the City Engineer will make an estimate in written form of the total amount of work done and of the acceptable materials furnished and delivered by the Contractor on the site and not used to the time of such estimate, and the value thereof. To assist the City Engineer in determining the value of acceptable materials which are on hand but not used, the Contractor shall furnish the City Engineer with copies of invoices for all such materials. The Owner shall retain 5 percent of such estimated value of work done, and 50 percent of the value of materials so estimated to be on hand but not used.

This retention will serve as part security for the fulfillment of the Contract by the Contractor. The Owner shall pay monthly to the Contractor the balance not retained of the aforesaid, after deducting there from all previous payments and all sums to be retained.

When in the judgment of the City Engineer, the work is not proceeding in accordance with the provisions of the Contract, or when in his judgment the total amount of the work done since the last estimate amounts to less than \$1,000.00, no pay estimate will be prepared and no progress payment will be made.

No estimates or payment shall be construed to be an acceptance of any defective work or improper materials.

The Contractor may, in accordance with the provisions of Government Code Section 4590, substitute securities for any monies which the Owner may withhold to insure performance under this Contract.

## 6.08 FINAL PAYMENT

Within 10 days after the completion of the work and its acceptance by the Owner, the City Engineer will make a final estimate in writing of the quantities of work done and the value thereof, and will prepare a Notice of Completion to be filed by the Owner. At this time, a semi-final payment will be made to the Contractor provided that such payment is warranted under the terms of Section 6.07. The amount of this payment shall be based on the total value of work acceptably performed under the Contract, subject to the same conditions and retentions as payments previously made under the monthly estimates.

Within 20 days after the date of the final estimate, the Contractor shall submit to the City Engineer either his written approval of the final quantities, and value of work as determined by the City Engineer, or a written statement of any and all claims for additional compensation claimed to be due under the Contract. No claim for which a notice of potential claim is required will be considered unless the Contractor has complied with the notice provisions of Section 3.21, nor will any claim be considered that was not included in said written statement of claims.

Failure of the Contractor to submit claims within the specified 20-day period, regardless of whether or not he files written approval, shall constitute his acceptance of the quantities and value of work determined by the City Engineer in the final estimate. No claim will be considered if filed after the specified 20-day period.

In the event the Contractor files claims within the specified 20-day period, the City Engineer will, within 10 days after receipt of said claims, consider and investigate the Contractor's claims and make his final determination. Should he find any revision to be warranted as a result of his investigation, the City Engineer will immediately notify the Owner and the final pay estimate will be revised accordingly.

Thirty-five days after the date of filing the Notice of Completion, the Owner will pay the entire sum found to be due, after deducting all previous payments and all amounts to be retained under the provisions of the Contract. As a condition of such payment, the Owner may require the Contractor to furnish a release of all claims against the Owner arising by virtue of the Contract. Payment will be withheld for any contract items for which a release is not furnished.

All prior partial estimates and payments shall be subject to correction in the final estimate and payments.

53

## 6.09 PAYMENT OF TAXES

The Contract prices paid for the work include full compensation for payment of federal, State or local taxes.



## 1.00 SCOPE OF THE WORK

# 1.01 GENERAL WORK DESCRIPTION

The work to be done under this Contract consists of installing 5.1 miles of new water main and associated distribution laterals to connect 114 properties to the City of Orland's existing water system, installing 27 fire hydrants, installing 6 blow off assemblies, and performing associated road repairs.

All construction shall conform to the requirements of the Contract Documents entitled:

## **ORLAND EMERGENCY GROUNDWATER RESOURCE PROJECT - PHASE 2A**

The intent of these contract documents is to provide for a completed work, and all items incidental and appurtenant to the specified items shall be included in the prices bid for the specified items.

## 1.02 DEFINITION OF TERMS

Wherever the words "City" or "Owner" appear in these documents, they shall be understood to mean the City of Orland, California.

Wherever the word "Contractor" appears in these documents, it shall be understood to mean the party or parties constructing the improvements for acceptance by the Owner.

Wherever the word "County" appears in these documents, it shall be understood to mean Glenn County, California.

Wherever the words "Department" or "DWR" appear in these documents, they shall be understood to mean the Department of Water Resources of the State of California.

Wherever the words "Drawings" or "Project Drawings" appears in these documents, it shall be understood to mean "Plans."

Whenever the word "Engineer" appears in these documents, it shall be understood to mean *GEI Consultants, Inc.*, Rancho Cordova, CA.

Wherever the words "City Engineer" or "City of Orland Representative" appear in these documents, they shall be understood to mean *Rolls, Anderson & Rolls*, Chico, California, acting either directly or through duly authorized agents.

Wherever the word "Landowner" appears in these documents, it shall be understood to mean the owner of the parcel upon which the Work will be constructed. Refer to Dwg. No. G-08 for a list of all applicable parcel numbers.

Wherever the words "Standard Detail(s)" appear in these documents, they shall be understood to mean the City of Orland Land Division Standards and Improvement Standards.

Wherever the words "USBR" or "Bureau of Reclamation" appear in these documents, they shall be understood to mean United States Bureau of Reclamation Department of the Interior.

# 1.03 SPECIFICATIONS AND PLANS

The work embraced herein shall be done in accordance with the current edition of City of Orland Land Division Standards and Improvement Standards, current edition of State of California Standard Specifications, current edition of State of California Standard Plans, and these Special Conditions. References to the State of California Standard Specifications include material and workmanship specifications only. All measurement and payment sections of the State of California Standard Specifications are specifically **NOT** included in these Specifications.

Should a conflict arise between the City of Orland Land Division Standards and Improvement Standards and the Special Conditions, the Special Conditions shall govern.

Should a conflict arise between the Standard Specifications and the Special Conditions, the Special Conditions shall govern.

Should a conflict arise between the General Conditions and the Special Conditions, the Special Conditions shall govern.

Where Standard Specifications or testing methods have been referred to, such as ASTM or AASHTO, the intent is to refer to the latest applicable issue or revision of such specifications or testing methods.

# 2.00 PROGRESS AND COMPLETION OF THE WORK

#### 2.01 AWARD OF CONTRACT

Refer to Section 8.00 of the Instructions to Bidders. The Award of Contract, if made, will be made within 30 days of the opening of Bids.

#### 2.02 TIME OF COMPLETION

The Contractor shall diligently prosecute the work to completion within <u>120</u> WORKING DAYS from the issuance of the Notice to Proceed by the Owner.

## 2.03 LIQUIDATED DAMAGES

The Contractor shall pay to the Owner the sum of \$1,100.00 per day, for each and every calendar day's delay in finishing the work in excess of the number of calendar days prescribed above.

## 3.00 CONTROL OF THE WORK

## 3.01 PREVAILING WAGE

The successful bidder shall post a copy of the applicable wage rates on the job site during the construction period. Contractors and subcontractors shall submit certified payrolls to the Department of Industrial Relations in accordance with State of California requirements.

#### 3.02 PERMITS AND LICENSES

No permits will be issued by the Owner for this work. It shall be the responsibility of the Contractor to secure all permits and licenses necessary, as well as pay all fees required for the completion of the work. The Contractor shall comply with all laws and regulations applicable to the work.

## 3.03 COORDINATION

The Owner, County, and public utility companies reserve the right to enter upon the work for the purpose of making changes necessitated by the improvements being constructed under this Contract. The Owners of the public utilities will coordinate such work with the Contractor and all parties shall cooperate to the fullest extent possible.

The Contractor shall protect from damage all utilities and other facilities that are to remain in place, be installed, relocated or otherwise rearranged.

## 3.04 SHOP DRAWINGS AND MATERIAL DATA

The Contractor shall provide shop drawings and material data, in accordance with the General Conditions, to the City Engineer within 15 days of the execution of the contract. Complete submittal packages shall be reviewed and approved prior to the issuance of the Notice to Proceed.

For this project submittals shall include, but not be limited to, mix designs, pipe materials, pipe joint details, special fittings or adaptors, imported bedding and backfill materials, and all technical design data required by the Engineer to verify product compliance with the Contract Documents.

## 3.05 UNDERGROUND SERVICE ALERT (USA)

The Contractor shall notify the Underground Service Alert at least 48 hours before excavating.

# 3.06 EXISTING UTILITIES

Existing underground utilities are indicated on the drawings, based upon record information. The depths of existing utilities are unknown. The Contractor shall verify the exact locations in the field to avoid damage to existing facilities.

The Contractor shall cooperate with utility companies in locating facilities and shall exercise care in working adjacent to or crossing such facilities to avoid damage. Any damage to existing facilities caused by the Contractor's operation shall be repaired by the Contractor at his expense.

# 3.07 RIGHTS OF WAY

The Contractor shall confine his operations to the limits of the rights-of-way provided. The Contractor is advised that if additional working space is required outside the limits of the rights-of-way provided, such additional area must be obtained directly from the property owners by the Contractor for use during the construction period. The Owner shall be furnished with copies of **written** agreements or otherwise notified **in writing** if additional working space is acquired.

## 3.08 HOURS OF OPERATION

The Contractor shall restrict his activities to the hours between 7:00 a.m. and 5:00 p.m. Monday through Friday, unless otherwise approved by the Owner.

## 3.09 NOISE CONTROL

All equipment used by the Contractor shall have noise muffling devices approved for use in residential areas.

## 3.10 DUST CONTROL

Where dust is created, either by the Contractor's vehicles or other vehicles, it shall be controlled by the Contractor through watering or preferably by cleaning up the material causing the dust. Dust control shall be continued as necessary until the work is accepted by the Owner.

## 3.11 PREVENTION OF WATER POLLUTION AND PREVENTION OF AIR POLLUTION

The Contractor shall prepare and submit to the Engineer a Storm Water Pollution Prevention Plan (SWPPP) within 10 calendar days after the Notice to Proceed is issued. The SWPPP shall include at a minimum the following BMPs:

- 1) Establish an erosion control perimeter around active construction and Contractor layout areas including silt fencing, jute netting, straw waddles, or other appropriate measures to control sediment from leaving the construction area.
- 2) Stockpiled soils shall be watered, covered, or otherwise managed to prevent loss due to water and wind erosion.
- 3) Install containment measures at fueling stations and at fuel and chemical storage sites.
- 4) Employ good house-keeping measures including clearing construction debris and waste materials at the end of each day.

57

The Contractor shall maintain a copy of SWPPP onsite at all times and shall abide by the SWPPP throughout the duration of the Project. It will be the Contractor's responsibility to:

- 1) Obtain, on behalf of the Owner, a Construction Storm Water Permit from the State Water Resources Control Board online via their website including the payment of all fees;
- 2) Submit all the reports to maintain compliance; and
- 3) Close out the Permit upon completion of the Work.

Additionally, the Contractor shall take measures as necessary to effect water pollution control. Construction operations shall be so conducted as to prevent discharge of wastes and pollutants into surface waters and underground water sources. Such water pollution control measures shall be directed toward eliminating discharge, or averting accidental spillage, of such industrial and domestic wastes as oils, gasses, fuels, sewage, toxic materials, and other substances which may be hazardous to public health and welfare or harmful to fish and wildlife. The Contractor shall be responsible for compliance with the applicable State and local regulations for prevention and abatement of pollution of surface and underground water. The Contractor's pollution control methods shall be subject to approval of the Engineer. The Owner shall have the right to require the Contractor, at his expense, to initiate and maintain such pollution control measures as deemed necessary to eliminate pollution of water caused by or resulting from the Contractor's operation. No separate payment will be made for prevention of water pollution, the costs for all work and materials required under this paragraph shall be borne by the Contractor.

The Contractor shall prepare and submit to the Engineer and all appropriate parties, a Site dust control and PM-10 Dust Management Plan within 10 calendar days after the Notice to Proceed is issued. The Contractor shall maintain a copy of said plan onsite at all times. The Contractor shall take measures as necessary to effect air pollution control.

Construction operations shall be so conducted as to prevent generation of fugitive dust and dispersion of pollutants into the air. Such air pollution control measures shall be directed toward eliminating particulates and potentially toxic or harmful materials from becoming airborne and polluting the air, as these airborne substances may be harmful to public health and/or harmful to wildlife. The Contractor shall be responsible for compliance with the applicable State, Glenn County Air Pollution Control District and local regulations for prevention and abatement of pollution of the air and any associated reporting requirements. The Contractor's pollution control methods shall be subject to approval of the Engineer as well as applicable governmental entities with regulative power over air quality. The Owner shall have the right to require the Contractor, at his expense, to initiate and maintain such pollution control measures as deemed necessary to eliminate pollution of air (and/or nuisance or fugitive dust) caused by or resulting from the Contractor's operation. No separate payment will be made for prevention of air pollution, the costs for all work and materials required under this paragraph shall be borne by the Contractor.

# 3.12 CONSTRUCTION WATER

The Owner will furnish water for dust control, cleaning operations, and testing from the Owner's existing system. No charge will be made for such water. However, it shall not be used wastefully, and it shall be the Contractor's responsibility to see that it is delivered to the place it is needed. The Contractor shall make a written request to the City of Orland Public Works Department for the installation of a hydrant meter prior to beginning work. The Contractor shall only use water from hydrants that have been fitted with hydrant meters. The Contractor shall furnish and use only proper hydrant wrenches when obtaining water from fire hydrants. No fire hydrant shall be obstructed in case of fire in the area served by the hydrant.

# 3.13 SANITATION

The Contractor shall provide temporary sanitation facilities at the work site, and maintain such facilities throughout the period of work on the project.

# 3.14 TESTING

All required testing of materials and construction methods will be provided by the Owner. Should tests show materials or methods to be unacceptable, however, and re-testing of the same material is required, the cost of such re-testing will be deducted from payments due the Contractor.

# 3.15 LANDSCAPE RESTORATION

All landscaping and irrigation facilities disturbed by the work shall be restored to its original condition by the Contractor. Any irrigation facilities in conflict with proposed improvements shall be replaced, repaired or relocated and tested by the Contractor. Testing of the irrigation facilities shall be done while the Public Works Director or his representative is present.

The Contractor shall take care to minimize damage to adjacent landscaping. Sod shall be installed where established grass has been removed. The Contractor shall restore landscaping as trenching and backfilling operations are completed. Restored landscaping shall be watered and maintained for thirty (30) days after placement.

No measurement of quantities will be made. Payment for restoring landscaping to existing conditions or as specified by the Engineer shall be included in the prices bid for the Bid Items.

## 3.16 OWNERSHIP OF REMOVED OR SURPLUS MATERIAL

Excavated concrete structures, pipe, iron and asphalt shall become the property of the Contractor, and removed from the site.

Miscellaneous construction materials, debris, rubble, backfill screenings, or deleterious material not suitable for backfill shall become the property of the Contractor, and removed from the site.

# 3.17 CLEANUP

The work area shall be kept in a neat and orderly condition during construction. The Contractor shall remove and dispose of all trash, debris and waste material resulting from his operations.

Upon completion of the work, the Contractor shall remove all debris, surplus material, equipment and supplies, and shall leave the entire work area in a neat, orderly condition.

## 3.18 TEMPORARY TRENCH RESURFACING

At the end of the workday, the work area shall be secured to prevent pedestrians from entering/driving into open trenches or other potentially dangerous environments. The Contractor shall provide temporary trench resurfacing, as necessary, throughout the project in compliance with the City Standards, County Standards, and as specified in the contract documents.

Alternatively, the Contractor may cover excavations within the street area subject to traffic loads with steel plating. The steel plating shall be of a thickness adequate to withstand the traffic loads that may be imposed and securely anchored at all times with temporary pavement to prevent displacement of the plate by traffic vibration.

## 4.00 WORK ZONE SAFETY

## 4.01 POLICY

The Contractor shall be **solely** responsible for safety on the job. Inspection of the work being performed or acceptance of work completed does not imply any approval or acceptance by the Owner of safety measures used by the Contractor.

The Contractor shall furnish, erect, and maintain at all times, substantial barricades, fences, signs, or other adequate protection.

The Contractor shall furnish, erect, and maintain at all times adequate sheeting, shoring, and bracing of all excavations in accordance with OSHA and California Industrial Safety Regulations. The Contractor shall be **solely** responsible for the adequacy and sufficiency of the safety equipment used.

The work shall be carried out in an orderly and systematic manner to present as little inconvenience as possible to public traffic. A minimum of one traffic lane shall be maintained on adjacent streets at all times.

# 5.00 INSURANCE REQUIREMENTS

## 5.01 GENERAL

The Contractor shall procure and maintain for the duration of the Contract insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by the Contractor, his agents, representatives, employees or subcontractors. The cost of such insurance shall be included in the Contractor's bid.

# 5.02 MINIMUM SCOPE OF INSURANCE

Coverage shall be at least as broad as:

General Liability and Umbrella or Excess Liability Insurance covering all operations by or on behalf of the Contractor providing insurance for bodily injury liability, and property damage liability for the limits of liability indicated below and including coverage for premises, operations and mobile equipment; products and completed operations; broad form property damage (including completed operations); explosion, collapse and underground hazards; personal injury; and contractual liability.

Automobile Liability Insurance, including coverage for all owned, hired and non-owned automobiles.

Workers' Compensation Insurance as required by the State of California and Employer's Liability insurance.

## 5.03 MINIMUM LIMITS OF INSURANCE

The Contractor shall maintain no less than:

- 1. General Liability:
  - a) \$1,000,000.00 per occurrence (combined a single limit for bodily injury and property damage).
  - b) \$2,000,000.00 aggregate for products-completed operations.
  - c) \$2,000,000.00 general aggregate. This general aggregate limit shall apply separately to the Contractor's work under this Contract.
  - d) \$5,000,000.00 umbrella or excess liability. Umbrella or excess policy shall include products liability and completed operations coverage. Further, the umbrella or excess policy shall contain a clause stating that it takes effect (drops down) in the event the primary limits are impaired or exhausted.

2. Automobile Liability: \$1,000,000.00 combined single limit each accident for bodily injury and property damage. The umbrella or excess liability coverage required above shall also apply to automobile liability.

- 3. Employers Liability:
  - a) \$1,000,000.00 per accident for bodily injury by accident.
  - b) \$1,000,000.00 policy limit for bodily injury by disease.
  - c) \$1,000,000.00 for each employee for bodily injury by disease.

## 5.04 DEDUCTIBLES AND SELF-INSURED RETENTIONS

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 retention as respects the City, its officials, employees, agents and volunteers; or the Contractor shall procure a bond guaranteeing payment of losses and related investigations, claim administration and defense expenses.

# 5.05 OTHER INSURANCE PROVISIONS

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

- The Engineer, City Engineer, Department, County, and City (including its officers, officials, employees, agents and volunteers) are to be covered as insureds as respects: liability arising out of activities performed by or on behalf of the Contractor; products and completed operations of the Contractor; premises owned, leased or used by the Contractor; or automobiles owned, leased, hired or borrowed by the Contractor. The coverage shall contain no special limitations on the scope of protection afforded to the Engineer, City Engineer, Department, County, and City (including its officers, officials, employees, agents and volunteers).
- 2. For any claims related to this project, the Contractor's insurance coverage shall be primary insurance as respects the Engineer, City Engineer, Department, County, and City (including its officers, officials, employees, agents and volunteers). Any insurance or self-insurance maintained by the Engineer, City Engineer, Department, County, and City (including its officers, officials, employees, agents and volunteers) shall be excess of the Contractor's insurance and shall not contribute with it.
- 3. Any failure to comply with reporting or other provisions of the policies including breaches of warranties shall not affect coverage provided to the Engineer, City Engineer, Department, County, and City (including its officers, officials, employees, agents and volunteers).
- 4. Coverage for such additional insureds shall not extend to liability:
  - a) arising from any defective or substandard condition of a City/County roadway which existed prior to the time the Contractor commenced work, unless such condition has been changed by the work or the scope of the work requires the Contractor to maintain existing City/County roadway facilities and the claim arises from the Contractor's failure to maintain; or,
  - b) for claims occurring after the work is completed and accepted unless these claims are directly related to alleged acts or omissions of the Contractor which occurred during the course of the work; or,
  - c) to the extent prohibited by Section 11580.04 of the Insurance Code.
- 5. The Contractor's insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability.

6. Each insurance policy required by this clause shall be endorsed to state that coverage shall not be suspended, voided, canceled by either party, reduced in coverage or in limits except after thirty (30) days prior written notice by certified mail, return receipt requested, has been given to the City of Orland.

# 5.06 WORKERS COMPENSATION AND EMPLOYERS LIABILITY COVERAGE

The insurer shall agree to waive all rights of subrogation against the Engineer, City Engineer, Department, County, and City (including its officers, officials, employees, agents and volunteers) for losses arising from work performed by the Contractor for the City.

## 5.07 ACCEPTABILITY OF INSURERS

Insurance is to be placed with insurers that are acceptable to the City of Orland.

# 5.08 VERIFICATION OF COVERAGE

Contractor shall furnish the City with original endorsements affecting coverage required by this clause. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. The endorsements are to be on forms provided by the City and all endorsements are to be received and approved by the City before work commences. As an alternate to the City's forms, the Contractor's insurer may provide complete, certified copies of all required insurance policies, including endorsements affecting the coverage required by these specifications.

# 5.09 SUBCONTRACTORS

Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

If the Contractor fails to maintain such insurance, the City may take out such insurance to cover any damages, for which the City might be held liable on account of the operations under this contract, and deduct and retain the amount of the premiums for such insurance from any sums due the Contractor under this contract. Nothing herein contained shall be construed as limiting in any way the extent to which the Contractor may be held responsible for payment of damages resulting from his operations, or those of any subcontractor under him.

## 5.10 NO PERSONAL LIABILITY

Contractor shall indemnify and hold harmless Engineer, City Engineer, Department, County, and City (including its officers, officials, employees, agents and volunteers) from and against claims, damages, losses and expenses including attorney fees arising out of the performance of the work described herein, caused in whole or in part by any negligent act or omission of the Contractor, any subcontractor, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable, except where caused by the active negligence, sole negligence, or willful conduct of the City.

# APPENDIX A

CERTIFICATE OF INSURANCE



Return Completed Certificate to City of Orland 815 Fourth Street Orland, CA 95963 Only this Certificate of Insurance form will be accepted

This certifies to the City that the following described policies have been issued to the Insured named below are in force at this time.
Insured
Address

Description of operation/locations/products insured (shown contract name and/or number, if any):

POLICIES AND INSURERS	LIMITS Bodily Injury Property Damage	POLICY NUMBER	EXPIRATION DATE
Worker's Compensation			
(Name of Insurer) Best's Rating	Employer's Liability \$		
Check policy type: Comprehensive General Liability or Commercial General Liability	"Claims Made" "Occurrence" Each Occurrence Each Occurrence \$ \$		
(Name of Insurer) Best's Rating	Or Combined Single Limit \$ \$ Aggregate \$		
Business Auto Policy Liability Coverage Symbol (Name of Insurer) Best's Rating	Each Person  SEach Accident  S or  Combined Single Limit \$		
Umbrella Liability	"Claims Made" "Occurrence"		
(Name of Insurer) Best's Rating	Occurrence/ Aggregate \$ Self-Insured Retention \$		

The following coverage or conditions are in effect:		No
The City, its officials, and employees are named on all liability policies described above as insureds as respects: (a) activities performed for the City by or on behalf of the named insured, (b) products and completed operations of the Named Insured, and (c) premises owned, leased or used by the Named Insured.		
Products and Completed Operations		
The undersigned will mail to the City 30 days' written notice of cancellation or reduction of coverage or limits.		
Cross Liability Clause (or equivalent wording)		
Personal injury, Perils A, B, and C		
Broad Form Property Damage		
X, C, U Hazards included		
Contractual Liability Coverage applying to this Contract		
Liquor Liability		
Coverage afforded the City, its officials, employees and volunteers as Insureds applies as primary and not excess or contributing to any insurance issued in the name of the City.		
Waiver of subrogation from Workers' Compensation Insurer.		
Environmental Liability Insurance		

All of the above policies expressly provide therein that they shall not be canceled by the insurer until 30 days written notice of the intended cancellation thereof has first been given to the City of Gridley by the insurer.

Agency or Brokerage

Address

Name of Person to be Contacted

**Telephone Number** 

Insurance Company

Home Office

Authorized Signature

Date

<u>Note</u>: Authorized signatures may be the agent's if agent has placed insurance through an agency agreement with the insurer. If insurance is brokered, authorized signature must be that of official of insurer.



# PART 1 GENERAL

## MOBILIZATION

- A. Mobilization shall consist of preparatory work and operations, including, but not limited to, those necessary for the movement of personnel, equipment, supplies, and incidentals to the site; for the establishment of all facilities necessary for work on the project; and for all other work and operations which must be performed, or costs incurred prior to beginning work, on the various items on the project site.
- B. Mobilization shall also include the construction of temporary access ways; temporary fencing; temporary signs; temporary facilities; and the necessary preparatory work required to allow for the safe and stable movement of all vehicles that are required to construct the improvements as shown and specified in the Contract Documents.
- C. See Technical Specification titled "Measurement and Payment" for additional items that are included in mobilization.

## DEMOBILIZATION

D. Demobilization shall consist of work and operations necessary to disband all mobilized items and clean up the site. The removal of all temporary access ways, signs, temporary fencing, and temporary facilities or works and the restoration of surfaces to an equal or better than existing condition shall also be included as part of demobilization.

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E. See Technical Specification titled "Measurement and Payment" for additional items that are included in demobilization.

# PART 2 MATERIALS

NONE

## PART 3 WORKMANSHIP

NONE





# PART 1 GENERAL

## MEASUREMENT AND PAYMENT

- A. All measurements will be based on the actual completed work performed in strict accordance with the specifications.
- B. Payment items for the work of this contract for which contract lump sum payments and unit price payments will be made are listed in the bid schedule and described below. All costs for items of work, which are not specifically mentioned to be included in a particular job or unit price payment item, are to be included in the listed job item most closely associated with the work involved. The unit price and payment made for each item listed constitutes full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.
- C. The Contractor shall submit a Schedule of Values that represents the cost of the work for each lump sum bid item with a value over \$5,000. The breakdown shall not exceed the lump sum value for that bid item. The Schedule of Values shall be approved prior to submitting the first progress payment, whether or not the request for payment includes any lump sum items. The Schedule of Values shall be broken down into separate work activities that adequately describe the work, with a cost associated with each activity. The minimum detail of each breakdown shall be a cost for; materials freight on board, installation, testing and acceptance. The Schedule of Values shall not be used to determine the value of deleted or changed work, but shall be used solely for determining the value of progress payments in accordance with the General Conditions.

# **BID ITEM DESCRIPTIONS**

## D. Bid Item No. 1 – Mobilization/Demobilization

- 1. <u>Description:</u>
  - a. Mobilization shall include all activities and costs for transportation of personnel, equipment, and operating supplies to and from the site; establishment of portable sanitary and refuse facilities; location, provision and installation of field offices & equipment/materials, storage yards excavation equipment, buildings, and other necessary facilities for the Contractor's operations at the site; premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable; temporary project signage; developing and providing construction water supply, pre-construction audio video survey, construction survey, and as-built project documents.
  - b. Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not included in the contract from the site; including the disassembly, removal and site cleanup, of offices, equipment, buildings, restoration of facilities, roads, fences, facilities etc. modified or disturbed during the course of the project and other facilities assembled on the site for this contract.
  - c. Contractor will be responsible to provide his own security for equipment, materials, fuel, tools, etc. that he may have on site.
  - d. The Contractor shall provide all necessary equipment & materials; all tools, accessories, power, fuel, materials, supplies, lighting, water, and other support equipment; and experienced personnel necessary to execute the work in an orderly an efficient manner.

- e. Bid item also includes all items necessary to complete the Project that are not covered under any other Bid Item.
- 2. <u>Measurement:</u>
  - a. The Owner makes partial payments for Mobilization/Demobilization costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:
    - 1) When 5 percent of the original contract amount is earned, 20 percent of the amount bid may be paid.
    - 2) When 10 percent of the original contract amount is earned, 40 percent of the amount bid may be paid.
    - 3) When 20 percent of the original contract amount is earned, 60 percent of the amount bid may be paid.
    - 4) When 50 percent of the original contract amount is earned, 80 percent of the amount bid may be paid.
    - 5) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. Payment:
  - a. Payment for Mobilization/Demobilization will be made at the lump sum price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete Mobilization/Demobilization as required by these specifications.

# E. Bid Item No. 2 – Environmental Compliance

- 1. <u>Description:</u>
  - a. The Contractor shall comply with all local, state and federal requirements for the Storm Water Pollution Prevention Program, site dust control, and other environmental compliance items identified in the General and Special Conditions. Contractor shall install, maintain, and remove all necessary measures to comply with the requirements of the applicable regulatory agencies. The Contractor shall also keep necessary documentation to prove compliance with said requirements. It will be the Contractor's responsibility to 1) obtain, on behalf of the City, a Construction Storm Water Permit from the State Water Resources Control Board online via their website; 2) submit all the reports to maintain compliance; and 3) close out the Permit upon completion of the Work. The Contractor is responsible for fees associated with all environmental compliance permits.

## 2. <u>Measurement:</u>

- a. The Owner makes partial payments for Environmental Compliance costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:
  - 1) When 25 percent of the original contract amount is earned, 25 percent of the amount bid may be paid.
  - 2) When 50 percent of the original contract amount is earned, 50 percent of the amount bid may be paid.
  - 3) When 75 percent of the original contract amount is earned, 75 percent of the amount bid may be paid.
- 4) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. <u>Payment:</u>
  - a. Payment for Environmental Compliance will be made at the lump sum price provided in the Bid, which shall include full compensation for furnishing all permits, fees, materials, labor, tools, equipment, and incidentals, and for doing all the work involved in water pollution control, completely, including all inspections, reporting, and removal of water pollution control items as specified in these Technical Specifications.

# F. Bid Item No. 3 – Site Management

- 1. <u>Description:</u>
  - a. Site Management shall include all activities and costs for providing a traffic control plan, permits, temporary gates and fences, barricades, signs, traffic control measures, and other safety measures to control vehicular traffic on access routes to the work site and at the work site during the project.
- 2. <u>Measurement:</u>
  - a. The Owner makes partial payments for Site Management costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:
    - 1) When 25 percent of the original contract amount is earned, 25 percent of the amount bid may be paid.
    - 2) When 50 percent of the original contract amount is earned, 50 percent of the amount bid may be paid.
    - 3) When 75 percent of the original contract amount is earned, 75 percent of the amount bid may be paid.
    - 4) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. <u>Payment:</u>
  - a. Payment for Site Management will be made at the lump sum contract price, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to provide the traffic control system, including the costs associated with obtaining the City of Orland and County of Glenn encroachment permits, as shown on the plans and as specified in these specifications.

# G. Bid Item No. 4 – Potholing and Utility Coordination

- 1. <u>Description:</u>
  - a. This item shall include providing all labor, materials, transportation, supplies, tools, equipment, traffic control, excavation, backfill, compaction, roadway resurfacing, and incidentals required to determine the locations, size, material, and depths of all existing underground utilities and tie-in locations for the proposed water pipelines in accordance with the Specifications and Plans. This item shall include all necessary coordination with the City of Orland, Orland Unit Water Users Association, USBR, Landowners, utility companies, and Glenn County and complying with their requirements.

# 2. <u>Measurement:</u>

- a. The Owner makes partial payments for Potholing and Utility Coordination costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:
  - 1) When 25 percent of the original contract amount is earned, 25 percent of the amount bid may be paid.
  - 2) When 50 percent of the original contract amount is earned, 50 percent of the amount bid may be paid.
  - 3) When 75 percent of the original contract amount is earned, 75 percent of the amount bid may be paid.
  - 4) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. <u>Payment:</u>
  - a. Payment for Potholing and Utility Coordination will be made at the lump sum price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete Potholing as required by these specifications.

# H. Bid Item No. 5 – Pavement Repair (Pavement Removal, Replacement, and Base)

- 1. <u>Description:</u>
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to perform an open cut type excavation for the proposed pipeline along City and County roadways. This includes, but is not limited to, saw cutting, pavement removal and disposal, material excavation, temporary road restoration (including temporary paving/patching), and permanent road restoration along the pipeline trench.

# 2. <u>Measurement:</u>

- a. The Owner makes partial payments for Pavement Repair costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:
  - 1) When 25 percent of the original contract amount is earned, 25 percent of the amount bid may be paid.
  - 2) When 50 percent of the original contract amount is earned, 50 percent of the amount bid may be paid.
  - 3) When 75 percent of the original contract amount is earned, 75 percent of the amount bid may be paid.
  - 4) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. <u>Payment:</u>
  - a. Payment for Pavement Repair will be made at the lump sum price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete repair of pavement along the pipeline trench as shown and required by the specifications.

# I. Bid Item No. 6 – Water System Tie-in Connection

- 1. <u>Description:</u>
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to connect to the existing City water system pipelines. This includes, but is not limited to, coordinating with the City for system shutdown, cutting the existing pipe if needed, dewatering the existing line, confirming existing pipeline material, location, and size, furnishing and installing couplings and fittings as needed to make connection, removing and replacing existing pipe thrust restraint, temporary pipe thrust restraint, repair of existing coating and lining, hardware, and any other labor, materials, transportation, supplies, tools, and equipment necessary to complete the work. The Contractor shall perform all necessary coordination and testing.
- 2. <u>Measurement:</u>
  - a. Bid Item will be paid on a per unit price basis and will be measured per individual water system tie-in connection performed.
- 3. <u>Payment:</u>
  - a. Payment for the Water System Tie-in Connection Bid Item will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete the water system tie-in connection to the City water system as shown and required by these specifications.

# J. Bid Item No. 7 – Water Service Connection

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals required to furnish and install single and double water service connections to residences in Project streets that may/may not have sidewalks, curbs, and gutters and may/may not require crossing the service line beneath a lined/unlined irrigation ditch. This includes, but not is limited to, connecting water service to water main, service piping, all necessary appurtenances including the meter box and lid, installation of the water meter, site clearing, demolition, site restorations, restoration of concrete curbs, gutter, sidewalks, and other incidentals to complete the work. Contractor is responsible for installing water service line between the water main and water meter; piping beyond water meter is not part of this Project.
  - b. The City will provide each water service meter to be installed by Contractor. The Contractor is required to coordinate pickup of each meter with the City.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per unit price basis and will be measured per individual water service installed. Double water service connections will be counted as two connections.
- 3. Payment:
  - a. Payment for the Water Service Connection will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the water service as shown and required by these specifications.

# K. Bid Item No. 8 – 10-inch PVC Pipe

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install the 10-inch C900 PVC DR 18 CL 235 and 10-inch C900 PVC DR 14 CL 305 water pipeline. This Bid Item includes, but is not limited to, the procurement and installation of all pipe, fittings, couplings, polyethylene encasement, tracer wire, buried piping locator tape, and appurtenances. The Contractor shall perform all activities, including but not limited to; excavation, shoring, subgrade preparation, bedding preparation, laying of pipe, installation of thrust blocks or joint restraints, backfill and compaction. The Contractor is responsible for the procurement of backfill material that meets the criteria presented in these specifications and plans. The City will perform compliance testing of the trench backfill. The Contractor is required to coordinate with the City for all compliance testing.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per linear foot basis and will be measured per linear foot of pipeline installed.
- 3. Payment:
  - a. Payment for the 10-inch PVC Pipe will be made at the linear foot price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the water pipeline as shown and required by these specifications.

# L. Bid Item No. 9 – 8-inch PVC Pipe

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install the 8-inch C900 PVC DR 18 CL 235 and 8-inch C900 PVC DR 14 CL 305 water pipeline. This Bid Item includes, but is not limited to, the procurement and installation of all pipe, fittings, couplings, polyethylene encasement, locating wire, buried piping locator tape, and appurtenances. The Contractor shall perform all activities, including but not limited to; excavation, shoring, subgrade preparation, bedding preparation, laying of pipe, installation of thrust blocks or joint restraints, backfill and compaction. The Contractor is responsible for the procurement of backfill material that meets the criteria presented in these specifications and plans. The City will perform compliance testing of the trench backfill. The Contractor is required to coordinate with the City for all compliance testing.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per linear foot basis and will be measured per linear foot of pipeline installed.
- 3. Payment:
  - a. Payment for the 8-inch PVC Pipe will be made at the linear foot price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the water pipeline as shown and required by these specifications.

# M. Bid Item No. 10 – 6-inch PVC Pipe

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install the 6-inch C900 PVC DR 18 CL 235 and 6-inch C900 PVC DR 14 CL 305 water pipeline. This Bid Item includes, but is not limited to, the procurement and installation of all pipe, fittings, couplings, polyethylene encasement, locating wire, buried piping locator tape, and appurtenances. The Contractor shall perform all activities, including but not limited to; excavation, shoring, subgrade preparation, bedding preparation, laying of pipe, installation of thrust blocks or joint restraints, backfill and compaction. The Contractor is responsible for the procurement of backfill material that meets the criteria presented in these specifications and plans. The City will perform compliance testing of the trench backfill. The Contractor is required to coordinate with the City for all compliance testing.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per linear foot basis and will be measured per linear foot of pipeline installed.
- 3. Payment:
  - a. Payment for the 6-inch PVC Pipe will be made at the linear foot price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the water pipeline as shown and required by these specifications.

# N. Bid Item No. 11 – 4-inch PVC Pipe

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install the 4-inch C900 PVC DR 18 CL 235 and 4-inch C900 PVC DR 14 CL 305 water pipeline. This Bid Item includes, but is not limited to, the procurement and installation of all pipe, fittings, couplings, polyethylene encasement, locating wire, buried piping locator tape, and appurtenances. The Contractor shall perform all activities, including but not limited to; excavation, shoring, subgrade preparation, bedding preparation, laying of pipe, installation of thrust blocks or joint restraints, backfill and compaction. The Contractor is responsible for the procurement of backfill material that meets the criteria presented in these specifications and plans. The City will perform compliance testing of the trench backfill. The Contractor is required to coordinate with the City for all compliance testing.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per linear foot basis and will be measured per linear foot of pipeline installed.
- 3. Payment:
  - a. Payment for the 4-inch PVC Pipe will be made at the linear foot price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the water pipeline as shown and required by these specifications.

# O. Bid Item No. 12 – Fire Hydrant Assembly

- 1. <u>Description:</u>
  - a. This item shall include providing all labor, materials, transportation, supplies, tools, equipment, and incidentals required to furnish and install a Fire Hydrant Assembly on the proposed water pipeline including, but not limited to, coordination with the Owner/City Fire Department for placement, wet barrel hydrant, break off riser, break off check valve, spool, fire hydrant bury, 6-inch isolation gate valve, traffic rated valve box and frame, concrete collar, concrete anchor block or pad for valve, valve stem extension, riser pipe, fittings needed to connect hydrant run to pipeline (C900 PVC pipe, ductile iron tees, bends (11.25°, 22.5°, 45°, 90° elbows), reducers, etc.), tracer wire, thrust blocks or restrained fittings, bollards, blue reflective pavement markers, all necessary appurtenances, site clearing, site restoration, and other incidentals to complete the work.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per unit price basis and will be measured per individual Fire Hydrant Assembly installed.
- 3. <u>Payment</u>:
  - a. Payment for the Fire Hydrant Assembly will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the fire hydrant as shown and required by these specifications.

## P. Bid Item No. 13 – Blow Off Assembly

- 1. <u>Description:</u>
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install a blow off assembly. This includes, but is not limited to, furnishing and installing the reducing coupling, brass piping (including fittings, adapters, and appurtenances), PVC piping (including fittings, adapters, and appurtenances), gate valve, concrete anchor block or pad, valve stem extension, riser pipes, valve boxes and frames with concrete collars, hardware, thrust block, tracer wire, and any other labor, materials, transportation, supplies, tools, and equipment necessary to complete the work. The Contractor shall perform all subgrade preparation, concrete and reinforcement placement, polyethylene encasement, backfill, and compaction.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per unit price basis and will be measured per individual Blow Off Assembly installed.

- 3. <u>Payment</u>:
  - a. Payment for the Blow Off Assembly will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the blow off assembly as shown and required by these specifications.

# Q. Bid Item No. 14 – 10-inch Gate Valve

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install a flanged 10-inch Gate Valve Assembly. This includes, but is not limited to, furnishing and installing the gate valve, concrete anchor block or pad, valve stem extension, riser pipe, valve box and frame with concrete collar, hardware, and any other labor, materials, transportation, supplies, tools, and equipment necessary to complete the work. The Contractor shall perform all subgrade preparation, concrete and reinforcement placement, polyethylene encasement, backfill, and compaction.

# 2. <u>Measurement</u>:

a. Bid Item will be paid on a per unit price basis and will be measured per individual 10-inch Gate Valve Assembly installed.

# 3. <u>Payment</u>:

a. Payment for the 10-inch Gate Valve will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the gate valve as shown and required by these specifications.

# R. Bid Item No. 15 – 8-inch Gate Valve

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install a flanged 8-inch Gate Valve Assembly. This includes, but is not limited to, furnishing and installing the gate valve, concrete anchor block or pad, valve stem extension, riser pipe, valve box and frame with concrete collar, hardware, and any other labor, materials, transportation, supplies, tools, and equipment necessary to complete the work. The Contractor shall perform all subgrade preparation, concrete and reinforcement placement, polyethylene encasement, backfill, and compaction.

# 2. <u>Measurement</u>:

- a. Bid Item will be paid on a per unit price basis and will be measured per individual 8-inch Gate Valve Assembly installed.
- 3. <u>Payment</u>:
  - a. Payment for the 8-inch Gate Valve Bid Item will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the gate valve as shown and required by these specifications.

# S. Bid Item No. 16 – 6-inch Gate Valve

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install a flanged 6-inch Gate Valve Assembly. This includes, but is not limited to, furnishing and installing the gate valve, concrete anchor block or pad, valve stem extension, riser pipe, valve box and frame with

concrete collar, hardware, and any other labor, materials, transportation, supplies, tools, and equipment necessary to complete the work. The Contractor shall perform all subgrade preparation, concrete and reinforcement placement, polyethylene encasement, backfill, and compaction.

- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per unit price basis and will be measured per individual 6-inch Gate Valve Assembly installed.
- 3. <u>Payment</u>:
  - a. Payment for the 6-inch Gate Valve Bid Item will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the gate valve as shown and required by these specifications.

# T. Bid Item No. 17 – 4-inch Gate Valve

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install a flanged 4-inch Gate Valve Assembly. This includes, but is not limited to, furnishing and installing the gate valve, concrete anchor block or pad, valve stem extension, riser pipe, valve box and frame with concrete collar, hardware, and any other labor, materials, transportation, supplies, tools, and equipment necessary to complete the work. The Contractor shall perform all subgrade preparation, concrete and reinforcement placement, polyethylene encasement, backfill, and compaction.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per unit price basis and will be measured per individual 4-inch Gate Valve Assembly installed.
- 3. <u>Payment</u>:
  - a. Payment for the 4-inch Gate Valve Bid Item will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the gate valve as shown and required by these specifications.

# U. Bid Item No. 18 – Hydrostatic Pressure Testing and Disinfection of Pipeline

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to perform hydrostatic pressure testing and perform disinfection of the constructed project pipelines, which includes, but is not limited to, coordination with the City and County, temporary bulkheads and valves, isolation of sections to be tested, flushing, filling, venting, and disposal of water in a legal manner.
- 2. <u>Measurement</u>:
  - a. The Owner makes partial payments for Hydrostatic Pressure Testing and Disinfection of Pipeline costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:

- 1) When 25 percent of the original contract amount is earned, 25 percent of the amount bid may be paid.
- 2) When 50 percent of the original contract amount is earned, 50 percent of the amount bid may be paid.
- 3) When 75 percent of the original contract amount is earned, 75 percent of the amount bid may be paid.
- 4) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. <u>Payment</u>:
  - a. Payment for Hydrostatic Pressure Testing and Disinfection of Pipeline will be made at the lump sum price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete all the hydrostatic pressure testing and disinfection of the proposed water system as shown and required by these specifications.

# V. Bid Item No. 19 – Project Identification Sign

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals to furnish and install a Project Identification Sign. This includes, but is not limited to, furnishing and installing the project identification sign per the contract plans and specifications (including adequate structural supports) and any other labor, materials, transportation, supplies, tools, and equipment necessary to complete the work. Work will include project sign installation, maintenance throughout the duration of the project, and removal and disposal at the end of the project.
- 2. <u>Measurement</u>:
  - a. Bid Item will be paid on a per unit price basis and will be measured per individual Project Identification Sign installed.
- 3. Payment:
  - a. Payment for the Project Identification Sign Bid Item will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the project identification sign as shown, as required by these specifications, and as directed by the Owner.

## W. Bid Item No. 20 – Large Utility (>12in. Dia.) Crossing

- 1. <u>Description:</u>
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals required to install the proposed water pipeline beneath existing large utility crossings (defined as utilities with a diameter or size greater than 12-inches) per these specifications and as shown in the plans. The limits of the Large Utility Crossing are defined as 15 feet down-station of center of utility to 15 feet up-station of center of utility. There are 12 large utility crossings identified on the plans:
    - 1) CA02-01 Approximately STA 200+60, 18" RCP SD
    - 2) CA03-03 Approximately STA 321+33, 48"x32" CONC IRR BOX CULVERT

- 3) CA04-06 Approximately STA 452+58, 24" PVC SEWER
- 4) CA04-06 Approximately STA 452+70, 15" CMP SD
- 5) CA05-01 Approximately STA 505+86, UNK SIZE SD
- 6) CA06-01 Approximately STA 600+12, 24" CONC SEWER
- 7) CA06-01 Approximately STA 600+35, 24" CONC SD
- 8) CA06-02 Approximately STA 617+39, 30" CONC SD
- 9) CA06-04 Approximately STA 632+27, 24" CONC SD
- 10) CA07-03 Approximately STA 727+71, 24" CONC SD
- 11) CA15-01 Approximately STA 1507+96, 18" CMP SD
- 12) CA15-01 Approximately STA 1508+51, 18" CMP SD
- b. This work includes, but is not limited to, existing utility protection, placement of CLSM, all necessary appurtenances, site clearing, site restoration, and other incidentals that are not included in PVC Pipe Bid Items 8, 9, 10 or 11.

# 2. <u>Measurement</u>:

- a. Bid Item will be paid on a per unit price basis and will be measured per individual crossing installed.
- 3. <u>Payment</u>:
  - a. Payment for the Large Utility (>12in. Dia.) Crossing will be made at the unit price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete installation of the water pipeline beneath large utilities as shown and required by these specifications.

# X. Bid Item No. 21 – Bridge Crossing – County Road 19

- 1. <u>Description</u>:
  - The Contractor shall provide all materials, equipment, labor, and incidentals а required to install the proposed water pipeline along the bridge crossing the Tehama-Colusa Canal on County Road 19 per contract plans and these specifications, including but not limited to, excavation, backfilling, imported trench backfill, placement of CLSM, compaction, grading, paving restoration, dewatering, thrust blocks, restraints for pipe joints and fittings, surveying of bridge, developing pipe layout drawings for submittal review, 10-inch PVC pipe (including fittings, adapters, and appurtenances), 10-inch steel pipe (including fittings, adapters, and appurtenances), welding of steel pipe, protection of existing bridge structures and utilities, transition coupling assemblies, gate valve assemblies, expansion joint assemblies, combination air valve assemblies, traffic-rated concrete vaults and extensions, support connections (such as mechanical anchors), other incidentals that are not included in PVC Pipe Bid Item No. 8, and the repair/replacement of fencing, AC dike, traffic signs, and reflective paddles. The limits of the Bridge Crossing - County Road 19 bid item extend from STA 615+25.6 to STA 616+53.6.

# 2. <u>Measurement</u>:

- a. The Owner makes partial payments for Bridge Crossing County Road 19 costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:
  - 1) When 25 percent of the original contract amount is earned, 25 percent of the amount bid may be paid.
  - 2) When 50 percent of the original contract amount is earned, 50 percent of the amount bid may be paid.
  - 3) When 75 percent of the original contract amount is earned, 75 percent of the amount bid may be paid.
  - 4) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. <u>Payment</u>:
  - a. Payment for Bridge Crossing County Road 19 bid item will be made at the lump sum price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete the installation of the water pipeline along the bridge crossing the Tehama-Colusa Canal on County Road 19 as shown and required by these specifications.

# Y. Bid Item No. 22 – Bridge Crossing – County Road 200

- 1. <u>Description</u>:
  - a. The Contractor shall provide all materials, equipment, labor, and incidentals required to install the proposed water pipeline along the bridge crossing the Tehama-Colusa Canal on County Road 200 per contract plans and these specifications, including but not limited to, excavation, backfilling, imported trench backfill, placement of CLSM, compaction, grading, paving restoration, dewatering, thrust blocks, restraints for pipe joints and fittings, surveying of bridge, developing pipe layout drawings for submittal review, 10-inch PVC pipe (including fittings, adapters, and appurtenances), 10-inch steel pipe (including fittings, adapters, and appurtenances), welding of steel pipe, protection of existing bridge structures and utilities, transition coupling assemblies, gate valve assemblies, expansion joint assemblies, combination air valve assemblies, support connections (such as mechanical anchors), other incidentals that are not included in PVC Pipe Bid Item No. 8, and the repair/replacement of fencing, AC dike, traffic signs, and reflective paddles. The limits of the Bridge Crossing – County Road 200 bid item extend from STA 732+10.6 to STA 733+60.9.

# 2. <u>Measurement</u>:

- a. The Owner makes partial payments for Bridge Crossing County Road 200 costs which shall adhere to Public Contract Code § 10264, modified as follows, and not to exceed the following:
  - 1) When 25 percent of the original contract amount is earned, 25 percent of the amount bid may be paid.
  - 2) When 50 percent of the original contract amount is earned, 50 percent of the amount bid may be paid.
  - 3) When 75 percent of the original contract amount is earned, 75 percent of the amount bid may be paid.

- 4) When 100 percent of the original contract amount is earned, 100 percent of the amount bid may be paid.
- 3. <u>Payment</u>:
  - a. Payment for Bridge Crossing County Road 200 bid item will be made at the lump sum price bid in the Proposal, which shall include full compensation for furnishing all materials, labor, tools, equipment, and incidentals and for doing all the work necessary to complete the installation of the water pipeline along the bridge crossing the Tehama-Colusa Canal on County Road 200 as shown and required by these specifications.
- PART 2 MATERIALS

NONE

PART 3 EXECUTION

NONE

## PART 1 GENERAL

## 1.01 SCOPE

- A. This section describes the requirements for pre-construction audio video recording of roadways and above grade facilities along the proposed pipeline alignments.
- B. Furnish all labor, materials, and equipment to furnish color audio video recording of the project site as specified herein.
- C. The Owner reserves the right to reject the audio video recording because of poor quality, unintelligible audio, or uncontrolled pan or zoom. Any audio video recording rejected by the Owner shall be redone at no cost to the Owner. Under no circumstances shall construction begin until the Owner has received and accepted the audio video(s).

### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Audio video recording firm qualifications and references.
- C. Initial and final audio video recording.

#### 1.03 QUALITY ASSURANCE

- A. The recording shall be performed by a qualified, established audio video recording firm knowledgeable in construction practices which has a minimum of one (1) year of experience in the implementation of established inspection procedures.
- B. The audio video recording firm shall submit three (3) letters of recommendation from municipalities, and/or engineering firms indicating previous experience and ability to perform the work described in this Contract. Data substantiating qualifications must be submitted and accepted prior to performing the survey.

## PART 2 MATERIALS

NONE

## PART 3 EXECUTION

## 3.01 COLOR AUDIO VIDEO SURVEY

- A. Utilizing a compatible format (i.e.: MP4), upload into the Owner's construction management software, or to a location designated by the Owner, a continuous color audio video recording along the entire route of the proposed pipeline(s) and the entire area for above ground facilities. The recording shall be taken prior to any construction activity.
- B. <u>Pipelines and Roads:</u> Complete coverage shall include all surface features located within the public right-of-way, easement areas, and adjacent private properties covering the extent of the R/W to be utilized by the Contractor of each side of the pipeline centerline and will be supported by appropriate audio description made simultaneously with video coverage. Such coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, gutters, ditches, channels,

bridges, roadways including viaducts, landscaping, trees, culverts, headwalls, and retaining walls, and buildings located within the R/W strip. Video coverage shall extend to the maximum height of all structures within this zone.

- C. <u>Above Ground Facilities:</u> Complete coverage shall include all surface features within 50 feet of the work area to be utilized by Contractor and shall be supported by appropriate audio description made simultaneously with video coverage. Such coverage shall include, but not be limited to, all existing driveways, sidewalks, curbs, gutters, ditches, channels, bridges, roadways, landscaping, trees, culverts, headwalls, and retaining walls, equipment, structures, pavements, manholes, vaults, handrails, etc. located within the aforementioned work zone. Video coverage shall extend to the maximum height of all structures within this zone.
- D. All recordings shall be performed during times of good visibility. Recordings shall not be performed during periods of visible precipitation, or when more than ten percent of the ground area is covered with standing water, unless otherwise authorized by Owner.

## 3.02 AUDIO AND VIDEO

- A. Contractor shall upload continuous color, audio-video(s) of professional quality.
- B. Each audio-video shall begin with the Owner's name, Contract name and number, Contractor's name, date and location information such as street name, direction of travel, viewing side, etc.
- C. Information appearing on the audio-video must be continuous and run simultaneously by computer generated transparent digital information. No editing or overlaying of information at a later date will be acceptable.
- D. Digital information will be as follows:
  - 1. Upper left corner
    - a. Name of Contractor
    - b. Day, date and time
    - c. Name of Project and Specification Number
  - 2. Lower left corner
    - a. Route of travel
    - b. Viewing side
    - c. Direction of travel
    - d. Pipelines: Stationing
- E. Time must be accurate and continuously generated.
- F. Engineering station numbers must be continuous, be accurate, and correspond with project stationing. The symbols shall be the standard engineering symbols (i.e. Station 100+00).
- G. Written documentation must coincide with the information on the audio-video so as to make easy retrieval of locations sought for at a later date.
- H. The video system shall have the capability to transfer individual frames of video electronically into hard copy prints.

- I. Audio shall be recorded at the same time as the video recording and shall have the same information as on the viewing screen. Special commentary will be given for unusual conditions of roads, bridges, ditches, channels, buildings, sidewalks and curbing, foundations, trees and shrubbery, etc.
- J. All audio-video shall bare labels with the following information:
  - 1. Recording Number
  - 2. Owner's Name
  - 3. Date of Recording
  - 4. Project Name and Specification Number
  - 5. Location and Standing Limit of audio-video
- K. Prior to commencement of audio video recording, the contractor shall notify the Engineer in writing when and where the audio video recording will begin. The Engineer may provide a designated representative to accompany and oversee coverage of all recording operations. Audio video recording completed without the Engineer's or his representative being present will be unacceptable unless specifically authorized by the Engineer.



TS 03-4

## PART 1 GENERAL

## 1.01 SCOPE

- A. This section describes the requirements for project identification and signs.
- B. Standard drawing for project identification signs is included in **Attachment A** of this section. Project identification signs shall be constructed in accordance with this standard.
- C. Furnish all labor, materials, and equipment for project identification and signs as specified herein.
- D. Commercial advertising matter shall not be attached to or painted on the surfaces of the signs.
- E. No signs, except those specified, shall be displayed, unless otherwise accepted by the City.

#### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. The Contractor shall submit the following for acceptance within 30 days of the Notice to Proceed:
  - 1. Type of grade of materials
  - 2. Layout, size, trim, framing, supports, and coatings
  - 3. Size and style of lettering
  - 4. Samples of colors
- C. Prior to fabrication of the signs, submit a "mock-up" sample of the proposed sign(s), information, and graphics for review and acceptance by the Owner.

## PART 2 MATERIALS

#### 2.01 GENERAL

- A. The structure and framing shall be allowed to be new or used, wood or metal, in sound condition, structurally adequate to work and suitable for specified finish. The sign surfaces shall be exterior softwood plywood with medium density overlay, standard large sizes to minimize joints; the thickness shall be as required by standards to span framing members and to provide even, smooth surface without waves or buckles. The rough hardware shall be galvanized.
- B. The size of the signs and lettering shall be as specified herein. The sign colors for structure, framing, sign surfaces and graphics shall be uniform colors throughout the Project, shall comply with the requirements specified herein, and shall be as selected by the Owner.
- C. The signs shall be painted signs, with painted lettering. Finishes and painting shall be exterior quality, adequate to resist weathering and fading for the duration of the Project. Use bulletin colors for graphics.
  - 1. Signs can be wrapped if contractor can provide details and assurances that signs will be adequate to resist weathering and fading for the duration of the project.

## 2.02 CONSTRUCTION OF SIGNS

- A. Use 3/4-inch exterior grade plywood or approved equal, unless shown otherwise.
- B. Use trim, mitered on all edges.
- C. Design signs and supports to withstand 75 mile-per-hour wind.
- D. Paint with exterior gloss-finish enamel. Sign painter shall be a professional in the type of work required.

## PART 3 WORKMANSHIP

## 3.01 INSTALLATION AND MAINTENANCE

- A. Location of signs shall be as shown or directed by Owner.
- B. Provide the necessary mounting posts and hardware.
- C. Maintain signs so they are clean, legible, and upright. Keep grass and weeds cut away from signs.
- D. If required by progress of the work or Owner, sign(s) shall be relocated to other acceptable site(s).
- E. Repair and repaint damaged structure, framing, and/or signs.
- F. Remove signs, framing, supports and foundations at completion of Project or when directed by Owner.

TS 04-2

## Attachment A to TS-04

## Standard Detail for Project and Information Signs

Small Community Drought Relief Program Program Sign Guidelines	
NAME OF PROJECT FOR NAME OF PUBLIC AGENCY	
Funding for this project has been provided in full or in part from the State Department of Water Resources. FINANCED UNDER THE	3' to 5'
Small Community Drought Relief Program	
ENGINEER:	
< 4' to 8'	
<ul> <li>This is a conceptual design sketch that is NOT to scale.</li> <li>Provide adequate structural supports for sign as site conditions may require.</li> <li>Keep sign a proper distance above prevailing grade to permit public viewing.</li> <li>Size DWR logo to permit public viewing.</li> <li>Paint letters blue (Blue No.15102 in federal color standard No.595).</li> <li>DWR Logo at: <a href="https://d3.water.ca.gov/owncloud/index.php/s/s8CFdC3cvgf9v9p/download">https://d3.water.ca.gov/owncloud/index.php/s/s8CFdC3cvgf9v9p/download</a></li> </ul>	

TS 04-3



TS 04-4

### PART 1 GENERAL

### 1.01 SCOPE

A. This section consists of providing a traffic control system for work within the City of Orland and Glenn County.

### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submit a Traffic Control and Work Site Safety Plan for the work site per Part 6, "Temporary Traffic Control" of the Standard Specifications for Public Works Construction, these specifications, and in consultation with Glenn County, and other applicable agencies.
- C. Submit a copy of the encroachment permits and riders obtained from applicable agencies.
- D. Submit a copy of approval of the traffic control plan obtained from applicable agencies.

#### PART 2 MATERIALS

#### 2.01 CONSTRUCTION AREA TRAFFIC CONTROL DEVICES

A. Flagging, signs, and temporary traffic control devices furnished, installed, maintained, and removed when no longer required shall conform to the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and the current edition of the California Manual on Uniform Traffic Control Devices.

#### 2.02 PORTABLE CHANGEABLE MESSAGE SIGNS

A. Portable changeable message signs shall comply with Section 12-3.12 "Portable Changeable Message Signs," of the Standard Specifications.

## PART 3 EXECUTION

#### 3.01 TRAFFIC CONTROL PLAN

A. The Contractor shall submit a traffic control plan conforming to the requirements of Part 6 of the current edition of the California Manual on Uniform Traffic Control Devices (CAMUTCD), which shall be approved by the Owner prior to beginning work.

## 3.02 MAINTAINING TRAFFIC

- A. Maintaining traffic shall conform to the provisions in Sections 7-1.08, "Public Convenience," Section 7-1.09, "Public Safety," and Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications and this Technical Specification.
- B. Closure is defined as the closure of a traffic lane or lanes, including shoulder, within a single traffic control system.
- C. Closures shall conform to the provision in "Traffic Control System for Lane Closure" of this Technical Specification.

- D. Full road closures are prohibited unless approved by Glenn County Director of Public Works.
- E. Contractor shall provide safe and continuous passage for local pedestrian and vehicular traffic at all times.
- F. Work that interferes with public traffic shall be limited to the hours when lane closures are allowed, except for work required under Sections 7-1.08, "Public Convenience," and Sections 7-1.09, "Public Safety."
- G. The full width of the traveled way shall be open for use by public traffic for Designated Legal Holidays and Special Days.
- H. Designated Legal Holidays are:
  - 1. Monday, January 2, 2023 New Year's Holiday
  - 2. Monday, February 20, 2023 Presidents' Day
  - 3. Friday, March 31, 2023 Cesar Chavez Day
  - 4. Monday, May 29, 2023 Memorial Day
  - 5. Tuesday, July 4, 2023 Independence Day
  - 6. Monday, September 4, 2023 Labor Day
  - 7. Friday, November 10, 2023 Veteran's Day
  - 8. Thursday and Friday, November 23 and 24, 2023 Thanksgiving
  - 9. Friday, December 22 and Monday, December 25, 2023 Christmas Holidays
  - 10. Friday, December 29, 2023 and Monday, January 1, 2024 New Year's Holidays
- I. Special Days are:
  - 1. Monday, January 16, 2023 Martin Luther King Jr. Day.
- J. Local authorities shall be notified at least 5 business days before work begins. The Contractor shall cooperate with local authorities to handle traffic through the work area and shall make arrangements to keep the work area clear of parked vehicles.
- K. All public streets that are to be closed or interrupted due to construction activities will require coordination with the City of Orland Public Works Department, Glenn County Public Works Agency, and emergency services. A minimum of 3 business days notice shall be given to these entities for said closures or interruptions.
- L. No work on local streets is allowed between 12:00 AM and 7:00AM and between 6:00PM and 12:00AM.
- M. Personal vehicles of the Contractor's employees shall not be parked on the traveled way or shoulders including sections closed to public traffic.

- N. Parking restrictions must be posted 24 hours before work starts and will be at the expense of the Contractor. Contact the police department, City of Orland Public Works Department, and Glenn County Public Works Agency when restrictions are placed.
- O. When work vehicles or equipment are parked within 6 feet of a traffic lane to perform active construction, the shoulder area shall be closed with fluorescent orange traffic cones or portable delineators placed on a taper in advance of the parked vehicles or equipment and along the edge of the pavement at 25-foot intervals to a point not less than 25 feet past the last vehicle or piece of equipment. A minimum of 9 traffic cones or portable delineators shall be used for the taper. A W20-1 (ROAK WORK AHEAD) or W21-5b (RIGHT/LEFT SHOULDER CLOSED AHEAD) or C24(CA) (SHOULDER WORK AHEAD) sign shall be mounted on a crashworthy portable sign support with flags. The sign shall be placed where designated by the Owner. The sign shall be a minimum of 48" x 48" in size. The Contractor shall immediately restore to the original position and location a traffic cone or delineator that is displaced or overturned, during the progress of work.
- P. If minor deviations from the lane requirement charts are required, a written request shall be submitted to the Engineer. The Engineer may approve the deviations if there is no significant increase in the cost to the Owner and if the work can be expedited and better serve the public traffic.

# 3.03 TRAFFIC CONTROL SYSTEM FOR LANE CLOSURE

- A. A traffic control system shall consist of closing traffic lanes in conformance with the provisions in Section 12, "Construction Area Traffic Control Devices," of the Standard Specifications, the CAMUTCD and this Technical Specification.
- B. The provisions in this section will not relieve the Contractor of responsibility for providing additional devices or taking measures as may be necessary to comply with the provisions in Section 7-1.09, "Public Safety" of the Standard Specifications.
- C. During traffic stripe operations and pavement marker placement operations using bituminous adhesive, traffic shall be controlled, at the option of the Contractor, with either stationary or moving lane closures. During other operations, traffic shall be controlled with stationary lane closures. Attention is directed to the provisions in Section 84-1.04, "Protection From Damage," and Section 85-1.06, "Placement," of the Standard Specifications.
- D. If components in the traffic control system are displaced or cease to operate or function as specified, from any cause, during the progress of the work, the Contractor shall immediately repair the components to the original condition or replace the components and shall restore the components to the original location.

# 3.04 STATIONARY LANE CLOSURE

- A. When lane closures are made for work periods only, at the end of each work period, components of the traffic control system, except portable delineators placed along open trenches or excavation adjacent to the traveled way, shall be removed from the traveled way and shoulder.
- B. Each vehicle used to place, maintain, and remove components of a traffic control system on multilane highways shall be equipped with a Type II flashing arrow sign which shall be in operation when the vehicle is being used for placing, maintaining, or removing the components. Vehicles equipped with Type II flashing arrow sign not involved in placing, maintaining or removing the components when operated within a stationary type lane closure shall only display the caution display mode. The flashing arrow sign shown on the approved traffic control plans shall not be used on the vehicles which are doing the placing, maintaining, and removing of

components of a traffic control system and shall be in place before a lane closure requiring the sign's use is completed.

# 3.05 PORTABLE CHANGEABLE MESSAGE SIGNS

- A. Portable Changeable Message Signs shall be deployed on project streets to advise approaching drivers of the construction at each area of work. Approaching drivers must be able to read the entire message for all phases at least twice at the posted speed limit before passing portable changeable message sign. You may use more than 1 portable changeable message sign to meet this requirement.
- B. Only display the message ordered by the Owner or specified in this Technical Specification.
- C. The text of the message displayed on portable changeable message sign must not scroll, or travel horizontally or vertically across the face of the message panel.
- D. Continuously repeat the entire message in no more than 2 phases of at least 3 seconds per phase.
- E. If useable shoulder is at least 15 feet wide, the displayed message on portable changeable message sign must be minimum 18-inch character height. If useable shoulder area is less than 15 feet wide, you may use a smaller message panel with minimum 12-inch character height to prevent encroachment in the traveled way.
- F. Start displaying a road closed message on portable changeable message signs 5 days before closing each project street indicating the name of the road to be closed, the date of the closure and the times that the closure will begin and end.
- G. Place portable changeable message sign in advance of the first warning sign for:
  - 1. Each stationary lane closure
- H. Place portable changeable message sign as far from the traveled way as practicable where it is legible to traffic and does not encroach on the traveled way. Place portable changeable sign before or at the crest of vertical roadway curvature where it is visible to approaching traffic. Avoid placing portable changeable message sign within or immediately after horizontal roadway curvature. Where possible, place portable changeable message sign behind guardrail or temporary railing (Type K).
- I. Except where placed behind guardrail or temporary railing (Type K) use traffic control for shoulder closure to delineate portable changeable message sign.
- J. Remove portable changeable message sign when not in use.
- K. Contractor shall obtain an encroachment permit from the Glenn County Public Works Agency prior to placing changeable message signs within County right-of-way and from the City of Orland Public Works Department when within City right-of-way.

# 3.06 TEMPORARY PAVEMENT DELINEATION

A. Temporary pavement delineation shall be furnished, placed, maintained, and removed in conformance with the provisions in Section 12-3.01, "General," of the Standard Specifications and these special provisions. Nothing in these special provisions shall be construed as reducing the

minimum standards specified in the CAMUTCD or as relieving the Contractor from the responsibilities specified in Section 7-1.09, "Public Safety," of the Standard Specifications.

- B. When the work causes obliteration of pavement delineation, temporary or permanent pavement delineation shall be in place before opening the traveled way to public traffic. Laneline or centerline pavement delineation shall be provided for traveled ways open to public traffic.
- C. Work necessary, including required lines or markers, to establish the alignment of temporary pavement delineation shall be performed by the Contractor. Surfaces to receive application of paint or removable traffic tape temporary pavement delineation shall be dry and free of dirt and loose material. Temporary pavement delineation shall not be applied over existing pavement delineation or other temporary pavement delineation. Temporary pavement delineation shall be maintained until superseded or replaced with a new pattern of temporary pavement delineation or permanent pavement delineation, or as determined by the Owner.
- D. Temporary pavement delineation shall be used on or adjacent to lanes open to public traffic for a maximum of 14 days. Before the end of the 14 days, if the permanent pavement delineation is not placed within the 14 days, additional temporary pavement delineation shall be provided by the Contractor at no additional cost to the Owner. The additional temporary pavement delineation to be provided shall be equivalent to the pattern specified for the permanent pavement delineation for the area, as determined by the Owner.
- E. Painted traffic stripe used for temporary delineation shall conform to Section 84-3, "Painted Traffic Stripes and Pavement Markings," of the Standard Specifications, except for payment. The number of coats shall be, at the option of the contractor, either one or 2 coats. The quantity of pained traffic stripe used for temporary delineation will not be included in the quantities of paint traffic stripe to be paid for.

# 3.07 TEMPORARY LANELINE AND CENTERLINE DELINEATION

- A. When lanelines or centerlines are obliterated, the minimum laneline and centerline delineation to be provided shall be temporary pavement markers placed at longitudinal intervals of not more than 24 feet. The temporary pavement markers shall be the same color as the laneline or centerline the markers replace. Temporary pavement markers listed for short term day/night use (14 days or less) or long term day/night use (6 months or less) in "Prequalified and Tested Signing and Delineation Materials" of the Standard Specifications shall be used. Temporary pavement markers shall be placed in conformance with the manufacturer's instructions and shall be cemented to the surfacing with the adhesive recommended by the manufacturer, except epoxy adhesive shall not be used to place pavement markers in areas where removal of the markers will be required.
- B. Temporary laneline or centerline delineation consisting entirely of temporary pavement markers shall be placed on longitudinal intervals of not more than 24 feet.
- C. Full compensation for furnishing, placing, maintaining, and removing temporary pavement markers used for temporary laneline and centerline delineation and for providing equivalent patterns of permanent traffic for these areas when required shall be considered as included in the contract prices paid for the Site Management Bid Item and no separate payment will be made therefor.
- D. Full compensation for furnishing, placing, and maintaining temporary painted laneline and centerline pavement delineation shall be considered as included in the contract prices paid for the Site Management Bid Item and no separate payment will be made therefor.



TS 05-6

Issued For Bid August 2023 Traffic Control

## PART 1 GENERAL

### 1.01 SCOPE

A. This section covers the installation, maintenance, and removal of water pollution control items, complete.

### 1.02 DEFINITIONS

- A. <u>Active Areas</u> are construction areas where soil-disturbing activities have already occurred and continue to occur or will occur during the ensuing 21 days.
- B. <u>BMPs</u> are Best Management Practices.
- C. <u>Non-Active Areas</u> are construction areas (formerly active areas) that will be idle for at least 21 days.
- D. <u>Disturbed Soil Areas (DSAs)</u> are areas of exposed, erodible soil that are within the construction limits and that result from construction activities.
- E. <u>Rainy Season</u> is defined as October 15th through April 15th.
- F. <u>Sediment Control Measures</u> are intended to complement and enhance the soil stabilization measures and reduce sediment discharge from construction areas. Sediment controls are designed to intercept and settle out soil particle that have been detached and transported by the force of water.
- G. <u>Soil Stabilization Measures</u> consist of source control measures that are designed to prevent soil particles from detaching and becoming transported in stormwater runoff. Soil stabilization BMPs protect the soil surface by covering and/or binding soil particles.
- H. <u>SCEs</u> are Stabilized Construction Entrances/Exits.
- I. <u>SWPPP</u> is a Storm Water Pollution Prevention Plan.

## 1.03 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. The Contractor shall prepare and submit to the Owner a Storm Water Pollution Prevention Plan (SWPPP) within 10 calendar days after the Notice to Proceed is issued in accordance with the Special Conditions.

## 1.04 WATER POLLUTION CONTROL IMPLEMENTATION

- A. Water pollution control measures, or BMPs, shall be implemented on a year-round basis at an appropriate level to minimize or prevent soil erosion and sediment discharges from leaving the construction site and/or entering a stormwater drainage system or receiving water. BMPs shall consist of an effective combination of both soil stabilization and sediment control measures.
- B. Active DSAs, during the rainy season, shall include soil stabilization measures installed prior to all predicted rain events and sediment control measures installed at all times. Active DSAs, during

TS 06-1

the non-rainy season, shall include soil stabilization measures and sediment control measures installed prior to predicted rain events.

C. Non-active DSAs, during the rainy season, shall include soil stabilization measures installed within 14 days of cessation of soil disturbing activities or 1 day prior to all predicted rain event, whichever occurs first and sediment control measures installed at all times. Non-active DSAs, during the non-rainy season, shall include soil stabilization measures and sediment control measures installed within 14 days of cessation of soil disturbing activities or 1 day prior to all predicted rain event, whichever occurs first.

## 1.05 INSPECTIONS

- A. Inspections shall be conducted by the Contractor at the following minimum frequencies:
  - 1. Prior to a forecast storm.
  - 2. After a rain event that causes runoff from the construction site.
  - 3. At 24-hour intervals during extended rain events.
  - 4. Weekly during the rainy season.
  - 5. Every 2 weeks during the non-rainy season.
  - 6. At any other time(s) or intervals of time specified in these Technical Specifications.

Inspections shall be completed under supervision of a Qualified SWPPP Practitioner (QSP) and/or Qualified SWPPP Developer (QSD).

## 1.06 REPORTING

- A. The Contractor shall notify the Owner immediately if one of the following occurs:
  - 1. Stormwater from a DSA is discharged to a storm drain system or waterway without treatment by an effective combination of temporary erosion and sediment control BMPs.
  - 2. Non-stormwater is discharged to a storm drain system or waterway without treatment by an effective combination of temporary erosion and sediment control BMPs.
  - 3. Stormwater is discharged to a waterway or storm drain system where the control measures (BMPs) have been overwhelmed or not properly maintained or installed.
  - 4. A discharge of hazardous substances occurs.
  - 5. Stormwater is discharged to a waterway or storm drain system containing hazardous substances.

TS 06-2

6. A discharge occurs that may endanger health or the environment.

## PART 2 MATERIALS

### 2.01 FIBER ROLLS

A. Fiber rolls shall consist of wood excelsior, rice or wheat straw, or coconut fiber that is rolled or bound into a tight tubular roll.

#### 2.02 SILT FENCE

A. Silt fence shall be woven polypropylene with a minimum width of 36 inches and a minimum tensile strength of 100 pounds. The fabric shall conform to ASTM D4632 and shall have an integral reinforcement layer. The reinforcement layer shall be a polypropylene, or equivalent, net provided by the manufacturer. The permittivity of the fabric shall be between 0.1 sec<sup>-1</sup> and 0.15 sec<sup>-1</sup> in conformance with ASTM D4491.

### 2.03 CRUSHED AGGREGATE

A. Crushed aggregate shall be a minimum of 3 inches and maximum of 6 inches in size conforming with Section 72-2.02 of the State Standard Specifications.

## 2.04 TEMPORARY ENTRANCE FABRIC

A. Temporary entrance fabric shall conform with Section 88-1.04 of the State Standard Specifications and be woven Type B or non-woven Type B.

#### 2.05 GRAVEL BAGS

- A. Gravel bags shall consist of the following items:
  - A bag that is woven polypropylene, polyethylene or polyamide fabric, minimum unit weight 4 ounces per square yard, Mullen burst strength exceeding 300 psi in conformance with ASTM D3786, and ultraviolet stability exceeding 70 percent in conformance with the requirements in ASTM D4355. The use of burlap is not acceptable. Each bag shall have a length of 18 inches, width of 12 inches, thickness of 3 inches, and mass of approximately 33 pounds. Alternative bag sizes shall be approved by the Owner.
  - 2. Fill material shall be non-cohesive, Class 1 or Class 2 permeable material free from clay and deleterious material, conforming to Section 68-1.025 of the State Standard Specifications. The requirements for the Durability Index and Sand Equivalent do not apply. Fill material is subject to approval by the Owner.

## 2.06 WOOD STAKES

Wood stakes shall be untreated fir, redwood, cedar, or pine and cut from sound timber. Stakes shall be straight and free of loose or unsound knots and other defects which would render stakes unfit for use and shall be pointed on the end to be driven into the ground.

## 2.07 STAPLES

Staples used to fasten silt fence material to stakes shall be not less than 1.75 inches long and shall be fabricated from 0.06 inch or heavier wire. The wire used to fasten the tops

TS 06-3

of stakes together when joining two sections of fence shall be 0.12 inches or heavier wire. Galvanizing of the fastening wire is not required.

## 2.08 STRAW

Straw shall conform with Section 20-2.06 of the State Standard Specifications.

## PART 3 EXECUTION

### 3.01 FIBER ROLLS

- A. Fiber rolls shall be installed as required to intercept runoff, reduce runoff flow velocity, release runoff as sheet flow, and provide removal of sediment from runoff. Potential areas for fiber rolls include:
  - 1. Along the toe, top, face, and at grade breaks of exposed and erodible slopes to shorten slope length and spread runoff as sheet flow.
  - 2. Below the toe of exposed and erodible slopes.
  - 3. Down-slope of exposed soil areas
  - 4. Around temporary stockpiles
  - 5. Along the perimeter of the project.
- B. Fiber rolls may be used for drain inlet protection if they can be properly anchored and if approved by the Owner.
- C. Fiber rolls shall be installed along level contours and shall be spaced as follows:
  - 1. Slope inclination of flatter than 10:1: 50 feet
  - 2. Slope inclination of 4:1 to 10:1: 20 feet
  - 3. Slope inclination of 4:1 to 2:1: 15 feet
  - 4. Slope inclination of 2:1 or greater: 10 feet
- D. Before placing fiber roll, remove obstructions including rocks, clods, and debris greater than 1 inch in diameter from the ground.
- E. In locations to receive fiber rolls, excavate a concave 2- to 4-inch furrow and place excavated material on downhill side, place fiber roll within furrow ensuring there are no gaps under the fiber roll, drive wood stakes through the middle of the fiber roll 6 inches from the end of the roll and spaced at a maximum of 4 feet on center at all other locations. Stakes shall be driven into the soil so that the top of the stake is less than 2 inches above the top of the fiber roll. Wood stakes shall be 1 inch by 2 inch and a minimum length of 24 inches. If more than one fiber roll is placed in a row, the rolls shall be overlapped, not abutted, by a minimum of 18 inches.
- F. Fiber rolls shall be inspected prior to forecast precipitation, following precipitation, and at least daily during prolonged rainfall. Split, torn, unraveling, or slumping fiber rolls shall be repaired or replaced. Fiber rolls shall be repaired or adjusted when rills and other evidence of concentrated runoff is visible. Sediment along fiber rolls shall be removed when the sediment accumulation

reaches 1/3 of the barrier height. Removed sediment shall be incorporated in the project at locations designated by the Owner.

G. Fiber rolls may be left in place at the approval of the Owner. If fiber rolls are removed, collect and dispose of sediment accumulation, and fill and compact holes, trenches, depressions or any other ground disturbance to blend with adjacent ground.

## 3.02 SILT FENCE

- A. Silt fence shall be installed as required to intercept and slow the flow of sediment-laden sheet flow runoff. Potential areas for silt fence include: below the toe of exposed and erodible slopes, down-slope of exposed soil areas, around temporary stockpiles, and along the perimeter of the project.
- B. The bottom of silt fence shall be keyed-in a minimum of 6 inches. Trenches shall not be excavated wider and deeper than necessary for proper installation of silt fence. Excavation of trenches shall be performed immediately before installation of silt fence. Silt fences shall be located at least 3 feet from the toe of slopes unless otherwise approved by the Owner. Silt fence shall be installed along level contours. Wood stakes shall be 2 inch by 2 inch and a minimum length of 48 inches.
- C. Silt fences shall be inspected prior to forecast precipitation, following precipitation, and at least daily during prolonged rainfall. Undercut, split, torn, slumping, or weathered silt fence shall be repaired or replaced. Sediment along silt fences shall be removed when sediment accumulation reaches 1/3 of the barrier height. Removed sediment shall be incorporated in the project at locations designated by the Owner. Silt fences that are damaged and become unsuitable for their intended purpose, as determined by the Owner, shall be removed and replaced by the Contractor.
- D. Once silt fences are not required for the project, the Contractor shall remove and dispose of the fences. The Contractor shall fill and compact holes and trenches, remove sediment accumulation, and grade fence alignment to blend with adjacent ground.

## 3.03 STABILIZED CONSTRUCTION ENTRANCE/EXIT

- A. Prior to beginning construction, the Contractor shall locate a staging area. The location of the staging area shall be approved by the Owner. The staging area shall be adequate to store materials, equipment, portable restroom facilities, concrete washout area, stockpiles, solid waste, and hazardous waste. If the approved staging area is unimproved, a Stabilized Construction Entrance/Exit (SCE) shall be installed and all access and egress shall be limited to this location. The location of the SCE shall be approved by the Owner.
- B. The SCE location shall be prepared by removing vegetation to ground level and clearing debris, grading ground to a uniform plane to prevent runoff from leaving the project, removing sharp objects that may damage fabric, and compacting the top 1 foot of soil to at least 90 percent relative compaction. The SCE shall be crushed aggregate over temporary entrance fabric that is a minimum 50 feet long, 20 feet wide, and 1 foot thick. As the SCE approaches the existing road the width shall be increased to accommodate vehicle turning movements. Overlap sides and end of fabric by at least 12 inches. Do not drive on fabric until crushed aggregate has been placed.
- C. The SCE shall be inspected routinely for damage and to assess the effectiveness. The SCE shall be repaired if fabric is exposed, depressions in the SCE surface develop, or if aggregate is displaced. Remove crushed aggregate and separate and dispose of sediment as necessary and as directed by the Owner.

D. Once the SCE is not required for the project, the Contractor shall remove and dispose of all materials and backfill and repair ground disturbance, including holes and depressions.

## 3.04 STRAW MULCH

- A. Straw mulch shall be installed on disturbed soil areas as required prior to the onset of precipitation for soil stabilization. Potential areas for straw mulch are: exposed soil areas and exposed temporary stockpiles.
- B. Straw mulch shall be applied by a straw blower or by hand. Straw shall be applied at a minimum rate of 4,000 pounds per acre. The mulch shall be anchored to the soil with a tackifier or by using mechanical methods (crimping, punch roller, track walking). If stabilizing emulsion is used, roughen soil by rolling with a crimping or punching-type roller or by track walking before placing mulch. The quantity of tackifier must be as recommended by the manufacturer. The ratio of water to fiber and tackifier in the mixture must be as recommended by the manufacturer. Straw mulch shall be evenly distributed on the soil surface. Straw mulch shall not be placed onto the traveled way, sidewalks, drainage channels, walls, fences, or existing vegetation. Straw mulch with tackifier shall not be applied during or immediately before precipitation, if water is standing on or moving across the soil surface, if the soil is frozen, or if the air temperature is below 40°F during the tackifier curing period unless allowed by the manufacturer and approved by the Owner.
- C. Straw mulch shall be inspected prior to forecast precipitation, following precipitation, and at least daily during prolonged rainfall. Straw mulch shall evenly cover DSAs without any exposed soil areas. Reapply straw mulch within 24 hours of discovering visible erosion. Straw mulch disturbed or displaced by the Contractor's vehicles, equipment, or operations must be reapplied. The Contractor shall repair any damaged mulch areas and re-mulch any exposed areas.
- D. Once straw mulch is not required for the project, the Contractor shall remove and dispose of all mulch. Straw mulch can be mechanically blended into the soil with track laying equipment, disking, or other approved method. Areas damaged during activities shall be re-graded per the Plans.

## 3.05 WIND EROSION CONTROL

A. All exposed soil areas shall be watered to prevent excessive amounts of dust. Watering, with complete coverage, shall occur at least twice daily, preferably in the late morning and after work is complete for the day. All clearing, grading, earth moving or excavation activities shall cease when winds exceed 25 miles per hour averaged over 1 hour. The area disturbed by demolition, clearing, grading, earth moving, or excavation operations shall be minimized at all times. Haul trucks shall be covered with tarpaulins or other effective covers at all times.

## 3.06 STREET SWEEPING AND VACUUMING

A. Visible sediment tracking shall be swept and/or vacuumed daily. Street sweeping must be done at paved roads at job site entrance and exit locations, and at paved areas within the job site that flow to storm drains. All paved areas shall be kept clear of sediment and debris.

# 3.07 VEHICLE AND EQUIPMENT CLEANING

A. Onsite vehicle and equipment washing or cleaning is discouraged. When vehicle/equipment washing/cleaning must occur onsite, the Contractor is required to notify and receive approval from the Owner prior to each occurrence. Washing/cleaning areas shall be located away from storm drain inlets, drainage facilities, or watercourses.

TS 06-6

## 3.08 VEHICLE AND EQUIPMENT FUELING

- A. Onsite vehicle and equipment fueling shall only be used where it's impractical to send vehicles and equipment offsite for fueling. When fueling must occur onsite, the Contractor shall select and designate an area to be used, subject to approval of the Owner. Absorbent spill clean-up materials and spill kits shall be available in fueling areas and on fueling trucks and shall be disposed of properly after use. Drip pans or absorbent pads shall be used during vehicle and equipment fueling, unless fueling is performed over an impermeable surface in a dedicated fueling area. If a spill occurs, the Contractor shall notify the Owner and immediately clean up the spill and properly dispose of contaminated soil and cleanup materials.
- B. Dedicated fueling areas shall be protected from stormwater run-on and runoff, and shall be located at least 50 feet from downstream drainage facilities. Fueling areas shall be protected with berms and/or dikes to contain spills. Fueling must be performed on level-grade areas. Nozzles used in vehicle and equipment fueling shall be equipped with an automatic shut-off to control drips. Fueling operations shall not be left unattended. Fuel tanks shall not be "topped off". Vehicles and equipment shall be inspected on each day of use for leaks. Leaks shall be repaired immediately, or problem vehicles or equipment shall be removed from the project site.

## 3.09 VEHICLE AND EQUIPMENT MAINTENANCE

A. Vehicle and equipment maintenance shall not occur within the project.

## 3.10 PAVING AND GRINDING OPERATIONS

- A. Substances used to coat asphalt transport trucks, asphalt trucks, and asphalt spreading equipment shall not contain soap and shall be non-foaming and non-toxic. Plastic materials shall be placed under asphaltic concrete paving equipment while not in use. Sand, gravel, spilled asphalt, or other materials from paving operations shall not enter storm drainage facilities and shall be recovered by the Contractor and disposed of as directed by the Owner.
- B. Removed pavement material shall be collected and properly disposed of by the Contractor. Residue from portland cement concrete and asphalt concrete grinding/saw-cutting operations shall be picked up by means of a vacuum system or sweeping and shall not be allowed to flow into the storm drainage system. Pavement removal, pavement grinding, and saw-cutting operations shall not be conducted in the rain.
- C. All thermoplastic striper and pre-heater equipment shutoff valves shall be inspected to ensure that they are working properly to avoid leaking. The pre-heater shall be filled carefully to prevent spilling of thermoplastic. The Contractor shall not pre-heat, transfer, or load thermoplastic near storm drain facilities or watercourses. Thermoplastic waste shall be properly disposed of by the Contractor.

## 3.11 STORM DRAIN INLET PROTECTION

- A. Storm drain inlets and catch basins located downstream of construction activities shall have water pollution control devices installed to capture sediment. The number and locations of control devices shall be as directed by the Owner.
- B. Storm drain inlet protection shall consist of filter fabric placed on the grate with either a gravel bag barrier or combination of fiber rolls with gravel bags placed upstream of grate to filter stormwater and collect sediment.

TS 06-7

C. Inspect all inlet protection devices before and after every rainfall event and weekly during the rest of the rainy season. During extended rainfall events, inspect inlet protection devices at least once every 24 hours. Sediment shall be removed when the sediment accumulation reaches 3/4 of the barrier height. Removed sediment shall be incorporated in the project at locations designated by the Owner.

## 3.12 SPILL PREVENTION PLAN

A. The Contractor shall provide a Spill Prevention Plan to the Owner for approval prior to beginning any work.

# PART 1 GENERAL

# 1.01 SCOPE

- A. This section describes the requirements for project as-built documents (drawings and specifications) and survey of completed pipelines and appurtenances.
- B. The Contractor shall maintain, at the job site, one complete set of Contract Specifications and Plans, Addenda, Change Orders, Construction Memoranda, other directions, and approved submittals. The Contractor shall also maintain, at the job site, one as-built set of technical specifications and full-size plans marked to show any deviations which have been made from the Contract Plans, approved shop drawings, or Contract Specifications, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated or which were not indicated on the plans. Said asbuilt drawings and specifications shall be supplemented by any detailed sketches as necessary or directed, to indicate fully the work as actually constructed.

# 1.02 DEFINITIONS

- A. <u>As-Built Drawings:</u> As-built drawings are defined as drawings prepared by the Contractor, which show, in red ink, on-site changes to the original issued for construction drawings.
- B. <u>As-Built Specifications:</u> As-built specifications are defined as those prepared by the Contractor, which show, in red ink, on-site changes to the issued for construction specifications.
- C. <u>As-Built Survey:</u> As-built survey is defined as a GPS survey prepared by the Contractor's Professional Land Surveyor licensed in the State of California, which shows the location of points, structures, etc. as specified herein.

# 1.03 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submit Draft As-Built Drawings and Specifications for Engineer review.
- C. Submit final As-Built Drawings and Specifications.
- D. Submit GPS survey file format and accuracy tolerances (horizontal and vertical).
- E. Submit As-Built Survey in a format acceptable to the Engineer.
- F. Submit verification of registration of the Professional Land Surveyor licensed in the State of California.

TS 07-1

## PART 2 MATERIALS

## NONE

## PART 3 EXECUTION

## 3.01 AS-BUILT DOCUMENTS

- A. Current As-Built Drawings and Specifications shall be accessible to the Owner and Engineer at all times during the construction period. They shall be reviewed with the Owner and/or Engineer at regular intervals.
- B. As-Built Drawings and Specifications shall be clearly and correctly annotated by the Contractor to show all changes made during the construction process at the time the changed Work is installed.
- C. Upon completion and prior to final inspection of the Work, the Contractor shall submit the As-Built Drawings and Specifications to the Engineer for review, and shall make such revisions or corrections as may be necessary for them to be a true, complete, and accurate record of the Work in the opinion of the Engineer. When approved, the Contractor shall deliver the As-Built Drawings and Specifications to the Engineer.

## 3.02 AS-BUILT DRAWING SURVEY

- A. In addition to the survey requirements listed in the General Conditions, the Contractor shall conduct a Global Positioning System (GPS) survey of the pipeline alignments prior to backfilling, where applicable. GPS survey accuracy shall be a minimum of 3 to 6 centimeters vertically and 1 to 3 centimeters horizontally. The GPS survey shall provide a vertical and horizontal position for each of the following:
  - 1. Top of the pipe every 500 feet, or as directed by the Engineer
  - 2. Each existing system connection
  - 3. Each fitting (HPI and VPI)
  - 4. Each lateral
  - 5. Each service connection
  - 6. Each meter box
  - 7. Each fire hydrant
  - 8. Each valve box
  - 9. Each tracer wire access box (where wire is not brought up in a valve box)
  - 10. Each air valve
  - 11. Each blowoff and/or end of line
  - 12. Top of concrete encasement (beginning and end)
- B. Data collected from the GPS survey shall be in a format suitable to import to a Geographic Information Systems (GIS)-based map. Contractor shall provide the accuracy tolerances both horizontally and vertically from the GPS survey for Engineer approval.
- C. The as-built survey shall be performed by a Professional Land Surveyor licensed in the State of California.
### 1.01 SCOPE

- A. This section describes the requirements to locate, excavate, expose, and determine ("pothole") the exact location, depth, material, and size of each and every utility shown and located in the field.
- B. Provide materials, equipment and labor required to execute this work as indicated on the drawings, specified herein, and necessary to complete the work of this section.

### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. The Contractor shall submit a comprehensive potholing plan that includes the following items:
  - 1. Potholing supervisor and staff qualifications and experience
  - 2. Potholing equipment and methods
  - 3. Backfill and compaction methods and materials in right of way and private property
  - 4. Sample pothole data sheet
  - 5. Existing lines to be potholed and intervals for parallel utilities
  - 6. Plan for protecting existing utilities in place
  - 7. Safety plan
  - 8. Disposal site
- C. Submit potholing results in a single comprehensive report.
- D. Submit immediate written notification to the Engineer where shown utilities deviate from field conditions.
- E. Submit immediate written notification to the Engineer if unmarked/unknown utilities are found.

# 1.03 QUALITY ASSURANCE

- A. Comply with applicable County and City permits and regulations.
- B. Comply with utility owners' notification, inspection, and crossing requirements.
- C. Use workers who are thoroughly trained and experienced in the work, who are completely familiar with the specified requirements and methods needed for proper performance of the work in this section.
- D. The Contractor shall have a sufficient supply of repair or replacement materials on the job site to repair or replace damaged or destroyed facilities including, but not limited to, sewer laterals, sewer mains, water mains, storm drains, irrigation lines, and water services.

TS 08-1

### PART 2 MATERIALS

### 2.01 GENERAL

A. All materials, labor, and equipment shall conform to these Technical Specifications.

### PART 3 EXECUTION

#### 3.01 GENERAL

- A. The location and existence of substructures were determined from a search of records maintained by their owners during the design phase.
- B. The location and existence of substructures shown were not determined by exploratory excavations performed during the design phase.
- C. The location of said utilities shown on the Drawings are considered to be approximate. No guarantee is made or implied that the information is complete or accurate. It shall be the Contractor's responsibility alone to determine the exact location of substructures of every nature and to protect them from damage.
- D. All facilities shown specifically on the Drawings and which have been marked by their respective owners shall be potholed.
- E. Water service locations, where shown, are based on approximate locations of existing meter boxes. Water service locations are shown in plan views only; they are not shown in the profiles and they are not identified with a utility interference flag.
- F. Sewer laterals, where shown, are based on limited available records. Sewer laterals are shown both in plan and profile views, but they are not identified with interference flags.
- G. Drain lines, where shown, are based on limited available records. Drain lines are shown both in plan and profile views, but they are not identified with interference flags.
- H. Irrigation water lines and locations, where shown, are based on limited available records and approximate locations of farm turnouts and existing valve boxes. Irrigation water lines are shown both in plan and profile views, but they are not identified with interference flags.
- I. Gas transmission lines, distribution lines, and service laterals, where shown, are based on approximate location of visible "gas" markings and/or limited records obtained from the owner. Gas lines are shown both in plan and profile views, but they are not identified with interference flags.
- J. Underground electrical lines, where shown, are based on limited records obtained from the owner. Underground electrical lines are shown both in plan and profile views, but they are not identified with interference flags.
- K. Communication lines, where shown, are based on approximate location of visible markings, and limited records obtained from the owner. Communication lines are shown both in plan and profile views, but they are not identified with interference flags.
- L. Overhead facilities, including, but not limited to, electrical facilities, cable facilities, and telephone facilities are shown in plan views only; they are not shown in the profiles and they are not identified with a utility interference flag.

M. Where underground main conductors or conduits such as water, gas, telephone, electric power, cable television, or other utilities are shown on Drawings, the Contractor shall assume that a service lateral from each utility facility extends to every parcel or property, whether or not a service lateral is shown.

### 3.02 TRAFFIC CONTROL

A. Traffic Control shall be in accordance with Technical Specification titled "Traffic Control."

### 3.03 NOTIFICATION

- A. The Contractor is responsible for calling Underground Service Alert at 811 at least 48 hours before any excavating, including potholing, and trenching work.
- B. Utilities located on private property may not be marked through USA. It is the Contractor's responsibility to contact each Landowner at least two (2) weeks before any excavating, including potholing, and trenching work and request that all irrigation and other service lines be marked.
- C. The Contractor is responsible for marking on the ground the location of the excavated area. In addition, the Contractor shall request that the owner's representatives be on site during potholing of all non-City owned underground facilities. Representatives of some and/or all affected utilities may be present at the preconstruction meeting; however, their presence at the preconstruction meeting shall not relieve the Contractor of the responsibility of notifying each utility prior to beginning any work.
- D. Any list of names and telephone numbers for utility or substructure owners shown on the Drawings or in any other contract document is intended for the convenience of the Contractor and is not guaranteed to be complete or correct.

# 3.04 POTHOLING

- A. At least thirty (30) business days prior to any construction, including saw-cutting or grading pavement, the Contractor shall excavate, expose, and determine ("pothole") the exact location (horizontal and vertical alignment), materials of construction, and depth of each and every utility crossing the proposed pipelines as well as the connection locations to the existing facilities at least 2,500 feet ahead of a pipe trench heading to provide sufficient lead-time to resolve utility conflicts. The Contractor shall also pothole at 200-foot intervals, but not less than the start and end where lines parallel the proposed lines, or other interval required/approved by the Engineer, all facilities that are parallel with, and within twenty (20) feet, of the proposed pipelines, as marked in the field by their respective owners and shown on the Drawings to determine exact location of said facilities.
- B. All potholing shall be completed, and the results furnished to the City at least twenty (20) business days prior to any construction, including saw-cutting or grinding pavement.
- C. At all locations where the Contractor is required to tie-into existing City owned pipelines, the Contractor shall pothole to determine the exact location (horizontal and vertical alignment), pipe materials, and pipe dimensions prior to procuring any materials. Contractor shall be responsible for determining if connections can be completed as shown on the plans or if design modifications need to be considered by the Engineer. If discrepancies are found, the Contractor shall immediately notify the Engineer so the appropriate changes can be made.

TS 08-3

- D. It shall be the Contractor's responsibility to make exploratory excavations (by "hand" where prudent) to determine the true location, depth, size, material, condition, and roundness of all utilities shown on the plans.
- E. Contractor shall protect all utilities crossing and parallel to the proposed pipelines in place, all based on Contractor's field measurements and at no additional cost to the City.
- F. If utility locations or tie-ins to City facilities vary from those shown on the Drawings, the Engineer may redesign alignment of pipelines. The Contractor shall construct the pipelines in accordance with the redesigned alignment at no additional cost to the City. Changes or delays caused by Contractor's failure to perform "potholing" and interference location work shall not be eligible for extra work compensation or time extension.
- G. Upon learning of the existence or location of any utility facility omitted from or shown incorrectly on construction drawings, or improperly marked or otherwise indicated, Contractor shall immediately notify the Engineer, providing full details as to depth below existing grade, location, size (outside diameter), and function. Contractor shall immediately notify utility having jurisdiction over facility.

### 3.05 REPAIR AND REPLACEMENT OF EXISTING UTILITIES

- A. Contractor shall not interrupt or disturb any utility facility without authority from the utility company, Landowner, or order from the City. Where protection is required to ensure integrity of utility facilities located as shown on the Drawings or visible to Contractor or marked or otherwise indicated as stated herein, Contractor shall, unless otherwise provided, furnish and place all necessary protection at no additional cost to the City.
- B. The Work requires Contractor to construct proposed pipelines and structures adjacent to existing utilities (water, sewer, gas, telephone, electric power, cable TV, compressed air, etc.) and existing improvements (sidewalks, driveways, pump stations, replenishment ponds, reservoirs, etc.). The Engineer and City do not have any information about compaction of trench backfill for said utilities and improvements. If said trench backfill fails during construction of proposed pipelines and structures, Contractor shall remove and replace said backfill, repair existing facilities (if damaged), compact as specified herein, and remove and replace any asphalt concrete pavement and Portland cement concrete as required, all at no additional cost to the City.
- C. The Contractor shall have a sufficient supply of repair or replacement materials on the job site to repair or replace damaged or destroyed facilities including, but not limited to, sewer laterals, sewer mains, water mains, storm drains, irrigation lines, and water services. Repairs shall be made with like materials and said repairs shall be approved by the Engineer, and owners of damaged utilities prior to backfill.

### 3.06 RESTORATION

- A. After the completion of work in planted or improved areas within public or private easements, the Contractor shall restore such areas to original condition and in accordance with City of Orland and Glenn County requirements.
- B. Two (2) working days after the conclusion of the Contractor's work at each site/location, all remaining field markings related to the project made by the various utilities using USA shall be removed by the Contractor, as directed by the Engineer.

TS 08-4

### 1.01 SCOPE

A. This section covers all work required to remove existing site and street facilities, including but not limited to, concrete curb, gutter, sidewalk, asphalt pavement, guardrail, existing ditches/channels, and all objectionable material from the project site within the limits of the proposed construction. Removed facilities shall be disposed of, salvaged, replaced in kind, reset, relocated or reconstructed as specified in these Specifications, as shown on the Plans, or as directed by the Engineer.

### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Proposed plans, details, methods, and equipment to be used for clearing, grubbing, and demolition operations.
- C. Sequence of operations for clearing, grubbing, and demolition.
- D. Measures to control dust and noise.
- E. Proposed temporary stockpile areas.
- F. Submit Engineer meeting requests prior to the following a minimum of 72 hours in advance:
  - 1. Field meeting prior to the start of clearing, grubbing, and demolition operations.

### 1.03 DEFINITIONS

- A. <u>Miscellaneous Facilities</u> shall include all structures, drainage, irrigation, right of way and traffic control facilities, and any other miscellaneous improvements or facilities.
- B. <u>Concrete</u> shall be defined as all or portions of mortared rubble masonry, brick or stone curbs, gutters and sidewalks; and portland cement concrete curbs, gutters, sidewalks, gutter depressions, driveways, aprons, slope paving, foundations, footings, and all other portland cement concrete or masonry construction. Concrete pipe and clay pipe will be considered as miscellaneous facilities to be removed, salvaged, replaced in kind or disposed of.

# PART 2 MATERIALS – NONE

# PART 3 EXECUTION

### 3.01 GENERAL

A. Existing facilities which are to remain in place shall be protected in conformance with State Standard Specifications 5-1.36. Trenches, holes, depressions and pits caused by the removal of facilities shall be backfilled with Class II aggregate base material as provided in the Technical Specification titled "Trench Excavation and Backfill."

- B. Clearing and grubbing shall be in accordance with Section 17-2 of the State Standard Specifications and these Contract Documents. Areas shown on the Plans shall be cleared and grubbed as applicable. No payment will be made to the Contractor for clearing and grubbing outside these limits, unless the work is authorized in writing by the Engineer. The area above the natural ground surface shall be cleared of all vegetation, such as trees, logs, upturned stumps, roots of down trees, brush, grass, weeds and other objectionable material. Clearing and grubbing shall be performed in advance of trenching operations and in accordance with the requirements specified in these Contract Documents.
- C. All materials removed, which are not to be salvaged or reused, shall become the property of the Contractor and shall be removed from the site by the Contractor. Demolition and disposal shall be in accordance with Section 14 of the State Standard Specifications and these Contract Documents. The Contractor shall be responsible for obtaining a suitable disposal site in accordance with the Special Conditions. The dumping ground site shall be in accordance with all Federal, State, and Local laws. Seek and obtain such approval and file with the Owner and Engineer copies of all approvals or agreements so obtained.
- D. Salvaged materials shall be delivered to the Owner's Public Works Department or other agreed upon site.

# 3.02 MEETING

A. Prior to the start of clearing, grubbing, and demolition operations, a field meeting shall be held with the Engineer to discuss limits, temporary stockpiling, and disposal of material. Contractor is required to coordinate this meeting.

# 3.03 CONCRETE CURB, GUTTER, SIDEWALK, AND DRIVEWAYS

A. Concrete curb, gutter, sidewalk, and driveways shall be removed at the locations shown on the Plans or as directed by the Engineer. Removal shall be to the lines and elevations shown, specified, or determined by the Engineer. Existing concrete shall be cut to a true line where new concrete is to join existing concrete. Existing concrete sidewalk and curb and gutter to be removed shall be cut to a true line at the closest score line or expansion joint beyond the excavation or the location shown on the Plans. Residue from saw-cutting shall be picked up by means of a vacuum device. Residue shall not be allowed to flow across the pavement and shall not be left on the surface of the pavement. Gravel bags shall be placed in the gutter pan prior to saw-cutting. Gravel bags shall remain in gutter pan until construction has been completed in that area. Concrete removal operations shall be performed without damage to any portion that is to remain in place. Damage to the existing concrete, which is to remain in place, shall be repaired to a condition equal to that existing prior to the beginning of removal operations. The cost of repairing existing concrete damaged by the Contractor's operations shall be at the Contractor's expense.

# 3.04 ASPHALT CONCRETE

A. Asphalt concrete shall be cut and removed to a true line at the location shown on the Plans or as directed by the Engineer. Residue from saw-cutting shall be picked up by means of a vacuum device. Residue shall not be allowed to flow across the pavement and shall not be left on the surface of the pavement. Gravel bags shall be placed in the gutter pan prior to saw-cutting. Gravel bags shall remain in the gutter pan until construction has been completed in that area. Asphalt concrete removal operations shall be performed without damage to any portion that is to remain in place. Damage to the existing asphalt concrete, which is to remain in place, shall be repaired to a condition equal to that existing prior to the beginning of removal operations. The

cost of repairing existing concrete damaged by the Contractor's operation shall be at the Contractor's expense.

### 3.05 GUARDRAIL

A. Guardrail shall be removed and re-installed at the locations shown on the Plans. All materials removed which are not to be salvaged or reused, shall become property of the Contractor and shall be removed from the site by the Contractor. The Contractor shall be responsible for obtaining a suitable disposal site in accordance with the Special Conditions.

### 3.06 TRAFFIC STRIPES, PAVEMENT MARKINGS AND MARKERS

- A. Traffic stripes and pavement markings shall be removed by any method that does not materially damage the existing pavement. Pavement marking images shall be removed in such a manner that the old message cannot be identified. Where grinding is used, the pavement marking image shall be removed by grinding a rectangular area. The minimum dimensions of the rectangle shall be the height and width of the pavement marking. Residue resulting from removal operations shall 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 into drainage facilities. Traffic stripes shall be removed before any change is made in the traffic pattern.
- B. Pavement markers, including underlying adhesive, shall be removed by such methods that will cause the least possible damage to the pavement or surfacing. Damage to the pavement or surfacing caused by pavement marker removal shall be repaired by the Contractor at the Contractor's expense by methods acceptable to the Engineer. During the removal of ceramic type pavement markers, screens or other protective devices shall be furnished to contain any fragments as provided for in State Standard Specification 7-1.04. Fragments resulting from the removal of pavement markers shall be removed from the road before the lane or lanes are opened to public traffic.

### 3.07 CONCRETE

A. Concrete shall be removed at the locations shown on the Plans or as directed by the Engineer. Removal shall be to the lines and elevations shown, specified, or determined by the Engineer. Existing concrete shall be cut to a true line where new concrete is to join existing concrete. Concrete removal operations shall be performed without damage to any portion that is to remain in place. Damage to the existing concrete, which is to remain in place, shall be repaired to a condition equal to that existing prior to the beginning of removal operations. The cost of repairing existing concrete damaged by the Contractor's operations shall be at the Contractor's expense.

# 3.08 SIGNS, SIGNPOSTS, AND SIGN FOUNDATIONS

A. Existing signs, signposts, and sign foundations as shown on the Plans shall be removed and disposed of in a legal manner. Holes, depressions and pits caused by the removal of signs, signposts, and sign foundations shall be backfilled with Class 2 aggregate base material as provided in the Technical Specification titled "Trench Excavation and Backfill", of these Technical Specifications unless otherwise noted on the Plans or directed by the Engineer. Existing signs, signposts, and sign foundations shall not be removed until replacement signs have been installed or until the existing signs are no longer required for the direction of public traffic, unless otherwise directed by the Engineer.

### 3.09 FENCE

A. Where shown on the Plans, existing fences shall be removed and rebuilt to conform to the new construction work. Fences shall be rebuilt with the same or better materials and shall be painted to match the existing fence.

### 1.01 SCOPE

A. This section covers trench excavation and backfill for water mains, water services, fire hydrant laterals, and excavation and backfill at valve boxes, utility boxes, meter boxes, and water system appurtenances.

#### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with the General Conditions, the Special Conditions, and SSPWC Subsection 3-8.
- B. Submit certification, gradations, classification, and source for onsite and imported materials proposed to be used in Work. Sample sizes shall be as determined by testing laboratory and approved by the Owner.
- C. Shop drawings shall be submitted showing excavation and shoring, bracing, or sloping for worker protection in accordance with the General Conditions. The Contractor shall comply with the provisions for "Shoring and Bracing Drawings" in Section 6705 of the California Labor Code. The Contractor, prior to beginning any trench or structure excavation five feet deep or over shall submit to the Owner and shall be in possession of the Owner's written acceptance of the Contractor's detailed plan showing design of all shoring, bracing, sloping of the sides of excavation, or other provisions for worker protection against the hazard of caving ground during the excavation of such trenches or structure excavation. If such plan varies from the shoring system established in the Construction Safety Orders of the State of California, such alternative system plans shall be prepared by a Civil or Structural Owner licensed in the State of California.
- D. Copy of the excavation permit issued by the California Department of Industrial Safety.
- E. Excavation equipment specifications and methods.
- F. Compaction methods and equipment specifications for all structures, roadways, foundations, and pipelines, including bell holes and pipe haunches.
- G. The slurry, CLSM, and concrete mix designs, prepared by the manufacturer, showing compliance with the specified properties.
- H. If required by the Owner, dewatering means and methods.
- I. Submit proposed means and methods to support box culverts and utilities greater than 12-inches in size.
- J. Stony Brook Irrigation Canal Crossing
  - 1. Submit a site specific excavation and shoring plan for this area, proposed linear feet of canal that will be removed, location and type of existing joints, thickness of existing lining, and reinforcement of canal lining. It is expected that some investigation will be required by the Contractor. Submit proposed means and methods to satisfy the submittal requirements.
- K. Submit Owner inspection requests prior to the following a minimum of seventy-two (72) hours in advance:

- 1. Trench subgrade.
- 2. Where required, prior to placing re-fill material.
- 3. Trench compacted material per compaction testing intervals and frequency.
- 4. Canal lining subgrade and joints.

### 1.03 DEFINITION OF ZONES

- A. <u>Pavement Zone</u> shall include the asphaltic concrete and aggregate base pavement section placed over the street zone. This zone is often referred to as the "structural section" of the street or highway.
- B. <u>Trench Zone</u> shall include 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.
- C. <u>Pipe Zone</u> shall include the full width of trench from the bottom of the pipe or conduit to a horizontal level 12-inches above the top of the pipe. This zone is also part of the "pipe-bedding zone" and as such, unless otherwise shown or specified, it shall be filled with bedding material identical to that which is placed in the bedding zone.
- D. <u>Bedding Zone</u> shall be defined as a layer of material immediately below the pipe zone extending over the full trench width. This is also part of the "pipe-bedding zone"
- E. <u>Pipe-Bedding Zone</u> shall include the zones defined as the "pipe zone" and the "bedding zone". It shall include the full width of the trench from the bottom of the trench to a point 12-inches above the top of the pipe. Unless otherwise shown or specified, the pipe-bedding zone shall be from 3-inches, or as shown on the Plans, under the pipe to 12-inches over the pipe.

### 1.04 QUALITY ASSURANCE AND TESTING

- A. Where a degree of relative compaction is specified on the Plans or in the Technical Specifications, compaction tests will be made in accordance with the Standard ASTM D 1557, Method C. All densities shall be expressed as a relative compaction in terms of the maximum density obtained in the laboratory by the foregoing standard procedure.
- B. Field density tests shall be performed in accordance with ASTM D 2922, Direct Transmission Method, using the nuclear gauge, or ASTM D 1556, using the sand cone. Backfill materials shall be sampled per ASTM D 75.
- C. "Relative Compaction" shall be expressed as the ratio, expressed as a percentage of the in place dry density to the laboratory maximum dry density.
- D. The Owner will provide lab services to take samples during placement of materials and test for moisture content, density, compaction, gradation, classification, and other required items to ensure conformance with these specifications.
- E. The Contractor is responsible for coordinating and scheduling all required inspection, sampling, and testing with the Owner provided lab.
- F. While the Owner will pay for compaction tests to verify that the Contractor has met all compaction requirements, the cost of all failing tests due to the Contractor's failure to meet the specifications

shall be paid for by the Contractor. Notify the Owner a minimum of seventy-two (72) hours prior to all inspection, sampling, and testing.

- G. Compaction Testing Intervals and Frequency:
  - 1. All excavations are subject to compaction tests.
  - 2. The location and frequency of tests shall be at the Owner's discretion.
  - 3. Testing shall be performed in the presence of the City of Orland representative.
  - 4. In general, the tests shall be taken as outlined below.
    - a. Testing of Pipelines shall be completed at the following intervals:
      - 1) A minimum of one (1) field density test shall be performed for each backfill lift per 250 linear feet of trench. Where the trench traverses a roadway, a minimum of one (1) field density test shall be performed for each backfill lift per travel lane.
- H. The presence of marginal materials or poor soil conditions, as determined by the Owner, or a prevalence of failed test results will be cause for substantially increasing the frequency and reducing the intervals of required testing. Alternatively, with approval of the Owner, the trench zone may be backfilled with a one-sack sand-cement slurry as specified herein at no additional cost to the Owner.
- I. Material placed between successful test and failed test shall be tested at one-fifth (1/5) the distance intervals specified herein until a passing test is achieved. All material from a failed test to a successful test shall be removed, recompacted, and retested by the Contractor per the direction of the Owner at no additional cost to the Owner.

# PART 2 MATERIALS

# 2.01 UNSUITABLE MATERIAL

- A. Unsuitable material includes the following:
  - 1. Topsoil containing debris, roots, trees, bushes, and vegetation (minimum of existing top 2 to 4-inches).
  - 2. Soils classified as Pt, OH, OL, MH, and CH under the Unified Soil Classification System (USCS).
  - 3. Material containing more than 3% organic material.
  - 4. Soils which cannot be compacted sufficiently to achieve the density specified for the intended use or soils rejected by the Owner.
  - 5. Material that contains hazardous or designated waste materials, including petroleum hydrocarbons, pesticides, heavy metals, and any material which may be classified as hazardous or toxic according to applicable regulations.
  - 6. Soils that contain greater concentrations of chloride or sulfite ions, or have soil resistivity or pH less than the existing on-site soils.

### 2.02 PIPE-BEDDING ZONE MATERIAL – IMPORTED

A. Imported pipe-bedding zone material shall be sand. Sand shall be free from clay or organic material, suitable for the purpose intended, and shall conform to the physical properties listed in the table below. Either gradation is acceptable (REU or PG&E).

Property	Test Method	Specification Requirement	
Organic Impurities	ASTM C40	Supernatant shall not be darker than plate 3 when compared to standard Gardner color series	
Sand Equivalent	ASTM D2149	Equal to or greater than 20	
Compaction Characteristics	ASTM D1557	Relative compaction of 95% or greater	
Gradation	ASTM C136 & ASTM C117	Sieve	Percent Passing (By Weight)
REU		<ul> <li>No. 4 (4.75 mm)</li> <li>No. 8 (2.36 mm)</li> <li>No. 16 (1.18 mm)</li> <li>No. 30 (600 um)</li> <li>No. 50 (300 um)</li> <li>No. 100 (150 um)</li> </ul>	<ul> <li>100</li> <li>90-100</li> <li>80-100</li> <li>65-100</li> <li>40-70</li> <li>0-30</li> </ul>
PG&E		<ul> <li>1/2"</li> <li>No. 4</li> <li>No. 50</li> <li>No. 100</li> <li>No. 200</li> </ul>	<ul> <li>100</li> <li>75-100</li> <li>0-70</li> <li>0-30</li> <li>0-15</li> </ul>

### 2.03 TRENCH ZONE MATERIAL – IMPORTED

A. Imported trench zone backfill material shall be clean, washed sand as specified in Article titled "Pipe-Bedding Zone Material – Imported" of this specification section.

# 2.04 TRENCH ZONE MATERIAL – NATIVE MATERIAL

A. Native backfill material shall be the material excavated from the site. The native material used for backfill shall be free of roots and debris, lumps, frozen material, and rocks larger than 3-inches in greatest dimension and meet other requirements as specified herein.

### 2.05 SLURRY CEMENT BACKFILL

A. Slurry cement backfill, conforming to Section 19-3.02l of the State Standard Specifications, except as modified below, shall consist of a fluid, workable mixture of commercial quality concrete sand, pea gravel, cement, and water. Not less than 94 pounds of cement shall be used for each cubic yard of material produced. Cement shall be Class II/V portland cement conforming to Section 90 of the State Standard Specifications, except that testing will not be required. The final mix design and mix consistency shall be subject to the approval of the Owner.

- B. Slurry Backfill Mix Design per Cubic Yard
  - 1. Pea Gravel: 2,600 lbs.
  - 2. Sand: 800 lbs.
  - 3. Cement: One sack
  - 4. Water: 11 gallons

# 2.06 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

- A. CLSM shall consist of free-flowing, self-compacting, and machine excavatable material that consists of cement, pozzolan fly ash, fine and coarse aggregates, and water in accordance with SSPWC Section 201-6.
- B. Aggregate gradation shall be as shown in SSPWC Table 200-1.2.1 (A) for Medium Fine 5/16" x No.8 (8.0 x 2.36mm) under SSPWC Section 200-1.
- C. Compressive strength at twenty-eight (28) days: Between 100 psi minimum and 200 psi maximum.

### 2.07 AGGREGATE BASE

A. Aggregate base shall conform to the requirements of the Technical Specification titled "Aggregate Base."

#### 2.08 ASPHALT CONCRETE

A. Asphalt concrete shall conform to the Technical Specification titled "Asphalt Concrete Pavement."

### 2.09 CONCRETE

- A. Concrete for concrete collars shall be Class B concrete in accordance with the Technical Specification titled "Concrete Work."
- B. Concrete for thrust blocks shall be Class C concrete in accordance with the Technical Specification titled "Concrete Work."
- C. Concrete for pipe cap or encasement shall be Class C concrete in accordance with the Technical Specification titled "Concrete Work."

### PART 3 EXECUTION

### 3.01 EXCAVATION

A. The Contractor shall excavate whatever substance encountered to the lines and grades shown on the Plans. All material suitable for use as backfill shall be piled in an orderly manner a sufficient distance from the side of the trench to avoid overloading and to prevent sliding into the trench. The Contractor shall do such grading as is necessary to prevent surface water from entering the excavation.

TS 10-5

- B. Except with the specific approval of the Owner, no more than 200 feet of open trench shall be excavated in advance of laying the pipe. Not more than 50 feet of trench excavation shall remain exposed (i.e. not backfilled) at the end of each day's work. The remainder of the trench shall be backfilled, compacted, and opened to traffic. All operations shall be carried out in an orderly fashion. Backfilling, compacting, and cleanup work shall be accomplished as sections of the pipe installation are approved and traffic through the work shall be impeded or obstructed as little as possible.
- C. Where trenches cross city streets, backfilling shall be completed immediately following excavation. No trenches across streets shall remain open overnight. All crossings shall be backfilled, compacted, and open to traffic at the end of each day's work. Major road crossings shall be excavated and backfilled in half widths of the traveled way so that at least one-half of the roadway is open to controlled traffic at all times during the work.
- D. Where it is necessary to cross fences, temporary gates or other barriers, or satisfactory obstructions shall be installed by the Contractor as required to keep livestock and/or household pets from entering or leaving the property. All cut fences shall be restored to original condition upon completion of backfilling of the trench.
- E. Where it is necessary to cross irrigation or drainage ditches, the backfill in the bottom and banks of such ditches shall be carefully placed and compacted to avoid settlement. Shape of the banks and bottom shall be restored and left in good condition.
- F. Explosives shall not be used for excavation.

# 3.02 WIDTH OF TRENCH

- A. Except where otherwise specifically permitted, banks of trenches shall be vertical, and shall be of uniform width from top to bottom. Trenches shall be a minimum of 8 inches wider than the external diameter of the pipe or the pipe manufacturer's recommended minimum, whichever is greater. The maximum width of the trench, measured at the top of the pipe, shall not exceed the width allowed for various strengths of pipe as may be specified elsewhere in the applicable sections of these Standard Specifications.
- B. If a maximum width is not specified, the width measured at the top of the pipe shall not exceed the external diameter of the pipe, exclusive of bells and collars, plus 24 inches.

### 3.03 STRIPPING OF TOPSOIL

A. Where the trench crosses cultivated, residential, or meadow land not in a roadway, the top 12 inches of soil shall be stripped and stockpiled separately from the balance of the excavated material so that later it may be placed in the top of the trench backfill.

# 3.04 BRACING OF TRENCHES

A. Where required to prevent caving of the trench, the Contractor shall furnish and install bracing and sheeting as necessary to protect the excavation and to meet safety regulations. If required by the Owner, the Contractor shall install sheeting and bracing as required to permit the City of Orland Representative safe access to the trench for inspection of the work. However, this requirement does not relieve the Contractor of the responsibility for maintaining the trench to meet safety regulations.

TS 10-6

# 3.05 DEPTH OF TRENCH

A. The bottom of the trench shall be carried to the lines and grades shown on the Plans with proper allowance for the thickness of the pipe and for the type of bedding specified. Any part of the trench excavated below the proper grade shall be corrected with Owner approved bedding material at the Contractor's expense. Relative compaction shall be not less than 95 percent.

### 3.06 DEWATERING

A. Suitable means and devices shall be provided and maintained to continuously remove and dispose of all 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. Water shall be disposed of in a legal manner to prevent damage to adjacent property. Trench water shall not be drained through the pipeline under construction. Groundwater shall not be allowed to rise around the pipe until jointing compound has firmly set.

# 3.07 FOUNDATION STABILIZATION

- A. After the required excavation has been completed, the City of Orland Representative shall inspect the exposed trench subgrade to determine the need for any additional excavation. It is the intent that additional excavation shall be conducted in all areas within the influence of the pipeline where unacceptable materials exist at the exposed subgrade.
- B. Overexcavation shall include the removal of all such unacceptable material that exists directly beneath the pipe base and to the depth required. The presence of unacceptable material may require excavating a wider trench. The width and depth of known areas to be overexcavated shall be shown on the drawings.
- C. The overexcavated portion of the trench shall be backfilled to the subgrade of the pipe base with re-fill material for foundation stabilization. Foundation stabilization material shall be placed over the full width of the excavation and compacted in layers not exceeding 6 inches in depth not less than 95% relative compaction, to the required grade.

# 3.08 APPURTENANCES

A. Excavations for valve vaults and other similar structures shall be large enough to provide proper working room. Any over-depth in excavation shall be corrected with concrete or other approved material.

# 3.09 REMOVAL OF WATER

- A. The Contractor shall remove and dispose of all water entering the excavation. Disposal of water shall be done in a manner to prevent damage or nuisance to adjacent properties. Water removed from the excavation shall not be disposed of in storm drainage facilities.
- B. Straw waddles, gravel bags, sediment traps, or other devices shall be provided to prevent silt and sediment from entering storm drainage facilities. Placement and maintenance of devices shall be in accordance with the plans, any Storm Water Pollution Prevention Plan (SWPPP) developed for the project, and as directed by the Owner.
- C. Sufficient pumping equipment shall be provided to maintain the trench in a dry condition during the bedding and initial backfilling of the pipe.

# 3.10 TYPES OF PIPE-BEDDING ZONE AND TRENCH ZONE MATERIALS

- A. Native Pipe-Bedding and Trench Zones
  - 1. Native materials shall not be used in the pipe-bedding zone.
  - 2. Suitable native or imported materials can be used in the trench zone.

### B. Imported Bedding Zone Material

1. Imported material shall be placed in the pipe-bedding zone in a layer the full width of the trench and of proper thickness to form the bed for the pipe. After the imported bedding has been placed and spread, it shall be compacted to proper grade to not less than 95% relative compaction.

# 3.11 CONCRETE ENCASEMENT

A. Concrete encasement shall be installed at the locations and in the manner shown on the Plans. The pipe shall be temporarily supported on masonry blocks. Supports shall be set accurately to grade with a minimum of two supports per joint of pipe. After the pipe has been laid and approved for covering, the pipe shall be bedded and encased in concrete as detailed on the Plans. Great care shall be taken not to float or shift the pipe during the concreting operation.

# 3.12 CONCRETE CAP

A. Concrete cap shall be installed at the locations and in the manner shown on the Plans. The pipe shall be supported on compacted backfill as shown. After the pipe has been laid and approved for covering, the pipe shall be capped with concrete as detailed on the Plans. Great care shall be taken not to shift the pipe during the concreting operation.

### 3.13 BACKFILLING – GENERAL

- A. No backfilling shall be done until the installation to be covered has been inspected and approved by the City of Orland Representative for covering. Backfilling shall be carried out in an orderly fashion and, in general, shall be done as soon as approval has been given to cover the pipe. Compaction of the backfill shall proceed simultaneously with backfilling operations.
- B. All excess backfill material shall be removed from within the project limits and disposed of by the Contractor. The location of the disposal site shall be the responsibility of the Contractor. Removal of excess material shall be done immediately following backfilling.
- C. Where trenches cross city streets, backfilling shall be completed immediately following excavation. No trenches across streets shall remain open overnight. All crossings shall be backfilled, compacted, and open to traffic at the end of each day's work. Major road crossings shall be excavated and backfilled in half widths of the traveled way so that at least one-half of the roadway is open to controlled traffic at all times during the work.

# 3.14 BACKFILLING – PIPE-BEDDING ZONE

A. The bed for the pipe shall be final-graded by hand to the lines, grades, and slopes to which the pipe is to be laid, making proper allowance for the thickness of the pipe. The bed shall be hand-raked ahead of the pipe laying operation to remove any stones or lumps which will interfere with smooth and proper bedding. Bell holes shall be hand-dug at the location of the joints and shall be

TS 10-8

of sufficient size to allow proper making of the joint and to prevent the collar or bell of the pipe from bearing on the bottom of the trench.

- B. After the pipe has been laid and approved for covering, backfill shall be placed evenly on both sides of the pipe the full width of the trench. This material shall be placed by hand in layers and each layer shall be compacted to 95% relative compaction by use of approved tampers.
- C. For pipe 10 inches in nominal diameter or less, the first layer shall be half the outside diameter in thickness, and shall be tamped by hand. The thickness of the next layer shall be half of the diameter of the pipe plus 12 inches.
- D. For pipe 12 inches and larger in nominal diameter, the backfill material shall be placed in layers not more than 8 inches thick.
- E. Particular care shall be taken to attain the required compaction in the material supporting the underside of the pipe. Compaction by jetting or ponding shall not be permitted.

### 3.15 BACKFILLING – TRENCH ZONE

- A. Backfill and compaction onsite and within private driveways and public roads shall be done in accordance with the terms of the *Public Works Improvement Standards*. The following requirements are minimums and do not relieve the Contractor of the responsibility of complying with any more stringent requirements of the *Public Works Improvement Standards*.
- B. Suitable native or imported materials can be used for backfill. The trench shall be backfilled in layers with suitable imported material which may be placed by machine. Material shall be placed in 8-inch thick layers and compacted by machine.
- C. Prior to commencing backfilling operations, the Contractor shall notify the Owner of the proposed method of compaction. No compaction method will be approved until the Contractor has demonstrated, under actual field conditions, that such method will produce the degree of compaction required.
- D. Relative compaction of the trench backfill material shall be not less than 90 percent and not less than 95 percent within 3 feet of the street surface.
- E. Immediately after backfilling, all excess material shall be removed and disposed of in an approved disposal area.

### 3.16 BACKFILL WITHIN CITY AND COUNTY STREETS AND PRIVATE DRIVEWAYS AND ROADS

- A. In public roads, backfill and compaction shall be done as shown. The following requirements are minimums and do not relieve the Contractor of the responsibility of complying with any more stringent requirements of the City of Orland Standards.
- B. The trench zone shall be backfilled in layers with suitable native or imported materials which may be placed by machine. Material shall be placed in 8-inch thick layers and compacted by machine.
- C. Prior to commencing backfilling operations, the Contractor shall notify the Owner of the method of compaction which he intends to use. No method will be approved until the Contractor has demonstrated, under actual field conditions, that such method will produce the degree of compaction required.

TS 10-9

D. Relative compaction of the trench backfill shall be not less than 90 percent and not less than 95 percent within 3 feet of the street surface.

# 3.17 SLURRY CEMENT BACKFILL

- A. Where shown on the Plans, and at locations approved by the Owner, the trench shall be backfilled with slurry cement from the top of the pipe bedding envelope to the bottom of the trench resurfacing structural section.
- B. Immediately after backfilling, all excess material shall be removed and disposed of in an Owner approved disposal area.

### 3.18 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

A. Place CLSM in accordance with SSPWC Section 201-6.

### 3.19 PROTECTION OF PAVING

A. During the entire construction period, the Contractor shall protect existing pavement. Tracklaying equipment shall be equipped with pavement pads when used on pavement. Any pavement damaged, cracked, or broken by the Contractor's operation shall be removed and replaced to at least the original condition. Damaged pavement shall be restored to the satisfaction of the Owner.

# 3.20 REMOVAL AND REPLACEMENT OF PAVING AND BASE

A. Only such paving and base shall be removed as is necessary to excavate the trench and install the pipe in accordance with requirements listed in Technical Specification titled "Asphalt Concrete Pavement." Cuts at valve vaults shall be no larger than necessary to install the structure.

### 3.21 REPLACEMENT OF PAVING

A. Paving shall be replaced in accordance with the Specifications, the City Improvement Standards, the County Improvement Standards, and the details shown on the Plans. Pavement shall be replaced in all streets and highways as soon as possible after completion of backfilling. In no case shall any section of trench in public roads remain unpaved more than one week from the date that the excavation was made. Where trenches cross roadways, pavement shall be replaced the same day the excavation was made.

### 3.22 TEMPORARY PAVEMENT

A. Where weather conditions or time preclude placing permanent pavement, temporary pavement will be installed. Temporary paving will consist of a one-inch-thick layer of premixed asphaltic surfacing material and shall be installed flush with the existing surface. Temporary pavement shall be maintained in a smooth and uniform condition, and shall be completely removed prior to placing permanent pavement.

### 3.23 PLACING AGGREGATE BASE

A. Where base material is required, the aggregate base shall be placed and compacted in one even layer to the depth shown on the Plans, and extending the full width of the trench, in accordance with requirements listed in Technical Specification titled "Aggregate Base." Segregation shall be avoided and extra care shall be taken in compacting the base near the sides of the trench. Relative compaction shall be not less than 95 percent.

# 3.24 PREPARATION FOR ASPHALT CONCRETE PAVING

A. Edges of existing paving shall be neatly cut along straight lines and the cut edges shall be vertical in accordance with requirements listed in Technical Specification titled "Asphalt Concrete Pavement." All loose pieces or cracked sections of existing paving shall be removed. All vertical edges shall be coated with liquid asphalt-emulsion.

# 3.25 INSTALLING ASPHALT CONCRETE

A. Asphalt concrete shall be placed to the thickness shown on the Plans or to match existing, whichever is greater, in accordance with requirements listed in Technical Specification titled "Asphalt Concrete Pavement."

### 3.26 CLEAN UP

A. The Contractor shall clean up and dispose of all trash, debris, and excess material, and shall remove his equipment from the site of the work as completed.

### 3.27 GUARANTEE

The Contractor shall guarantee the work against settlement for a period of one (1) year.

TS 10-11



### 1.01 SCOPE

A. This heading covers the removal, furnishing, placement, and compaction of asphalt concrete paving material, complete.

#### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Pavement removal plan, including limits, and list of equipment used in this activity.
- C. Mix Design
  - 1. Submit asphalt mix design data prepared within the last year by a certified laboratory acceptable to Engineer and Owner for each asphalt concrete material type used on the project.
- D. Materials Quality
  - 1. Submit materials certificates signed by material producer and Contractor, certifying that each material item complies with, or exceeds, specified requirements.
- E. Materials Source
  - 1. Submit materials certificates signed by material producer and Contractor, identifying material producer by name, location of material producing plant, and type of plant from which material will be produced and delivered.
- F. Submit proposed pavement placement and sequence and schedule.

### 1.03 INSPECTION AND TESTING

- A. Conformity with Contract Documents
  - 1. Work and materials shall conform to the lines, grades, cross sections, dimensions and material requirements including tolerances, shown on the plans and as specified herein.
- B. Advance Notice
  - 1. At least seventy-two (72) hours advance notice shall be given when requesting inspection of work. No paving or concrete operations shall be permitted except in the presence of a City of Orland Representative.
- C. Access for Inspection and Testing
  - 1. The Contractor and material producer shall, at all times, provide safe access for inspection of the work by the City of Orland Representative to any shops, production plants, or areas where materials or portions of the work are in progress. The City of Orland Representative shall be given assistance as necessary for performing tests, and shall be kept apprised of work schedules.

# D. Materials Testing

- 1. Unless otherwise specified in the General Conditions or the Special Conditions, the City will provide materials testing in accordance with the current published methods as specified and used by the following agencies:
  - a. American Society for Testing and Materials (ASTM)
  - b. American Association of State Highway and Transportation Officials (AASHTO)
  - c. Test Methods as developed by Materials and Research Department California Department of Transportation Division of Highways, Sacramento, California

### E. Samples

- 1. If required by the Owner, in general, samples for testing will be taken by a private laboratory contracted by the City from material at the production plant and/or material delivered to the site of the work, and such material should be available in ample time to allow for such testing. The City reserves the right to stipulate the number and location of the control tests which will relate to ultimate acceptance of the work by the Owner.
- F. Removal of Rejected and Unauthorized Work
  - 1. Work which has been rejected shall be remedied, or removed and replaced in an acceptable manner as determined by the City of Orland Representative. Any work done beyond the lines and grades shown on the plans or established by the Owner, or determined by the City of Orland Representative to not be of acceptable material quality, or of acceptable workmanship, or any work done without written authority shall be considered as rejected work. Upon order of the City of Orland Representative, work shall be remedied, removed, or replaced at no expense to the Owner.
- G. Equipment
  - 1. The Contractor shall provide adequate and suitable equipment to meet the requirements of the Contract Documents

# PART 2 MATERIALS

### 2.01 AGGREGATE BASE

A. Aggregate base material shall conform to the requirements listed in Technical Specification titled "Aggregate Base."

### 2.02 HOT MIX ASPHALT (HMA)

A. Use asphalt concrete that is Type A, 3/4-inch maximum with gradations per Section 39-2.02B(4)(b) of the State Standard Specifications.

# 2.03 ASPHALT BINDER

A. Asphalt Binder shall be PG 64-10 conforming to the requirements of Section 92 of the State Standard Specifications.

TS 11-2

#### 2.04 PRIME COAT

A. Prime coat shall be Grade SC-250 and conform to Section 94 of the State Standard Specifications.

### 2.05 PAINT BINDER (TACK COAT)

A. Tack coat shall be an asphaltic emulsion, Grade SS1, and conform to Section 94 of the State Standard Specifications.

#### 2.06 STRIPING

- A. Replacing existing striping, traffic markings, pavement markers in accordance with the applicable portions of the State Standard and the provisions of Section 84 of the State of California Standard Specifications.
- B. Paint color and type shall be as indicated on the drawings, or if not indicated, shall match as nearly as practical to the existing conditions of the site.

#### PART 3 EXECUTION

#### 3.01 STRIPING, TRAFFIC MARKINGS, AND PAVEMENT MARKERS – REMOVAL

- A. Prior to placement of asphalt concrete, remove existing striping, traffic markings, and pavement markers in accordance with Technical Specification titled "Clearing, Grubbing, and Demolition" and with the provisions of Section 84-9 of the State of California Standard Specifications.
- B. Striping and pavement markings obliterated by the construction work shall be re-installed using temporary striping or markings prior to the installation of pavement striping and markings.

#### 3.02 PAVEMENT REMOVAL

A. Saw cutting, removal, and disposal of existing asphalt pavement shall be in accordance with Technical Specification titled "Clearing, Grubbing, and Demolition" and Section 39-3 of the State Standard Specifications.

#### 3.03 PLACING AGGREGATE BASE

A. Aggregate base shall be placed to the thickness shown on the Plans or to match existing, whichever is greater, in accordance with requirements listed in Technical Specification titled "Aggregate Base."

#### 3.04 PAINT BINDER (TACK COAT)

A. Paint binder shall be applied to all vertical surfaces of existing pavement, curbs, gutters, construction joints and to pavement to be resurfaced. Before placing HMA, apply paint binder in one (1) application. Application rates and procedures shall conform to Section 39-2.01C(3)(f) of the State Standard Specifications.

#### 3.05 PRIME COAT

A. Prime coat shall be applied to all aggregate base surfaces to receive HMA. Apply at least 0.20 gallons of prime coat per square yard of designated area. Do not apply more prime coat than can be absorbed completely by the aggregate base in 24 hours. Before paving, prime coat must cure

TS 11-3

for 48 hours. Close traffic to areas receiving prime coat. Do not track prime coat onto pavement surfaces beyond the job site.

# 3.06 PLACING ASPHALT CONCRETE MATERIAL

A. HMA shall be transported, placed, spread, and compacted in conformance with the provisions of Section 39-2 and Section 39-3 of the State Standard Specifications. HMA shall be spread in one operation with a self-propelled spreader ready for compaction without further shaping.

#### 3.07 STRIPING, TRAFFIC MARKINGS, AND PAVEMENT MARKERS - REPLACEMENT

- A. Following placing of asphalt concrete, replace existing striping, traffic markers, and pavement markers in accordance with the provisions of Section 84-2 of State Standard Specifications, the Owner, and the County Inspector. Unless otherwise required by the Owner and County, all markers shall be the thermoplastic type.
- B. Paint color and type shall match as nearly as practical the existing conditions of the site.

### 3.08 SURFACE TOLERANCE

- A. Finished grade shall not deviate more than 0.02 foot in elevation from the grade indicated on the drawings. Slopes shall not vary more than 1/8 inch in 10 feet from the slopes shown on the Plans. Final pavement below the existing surface will not be accepted.
- B. Asphalt pavement placed with deviations exceeding those listed above shall be corrected in accordance with SSPWC subsection 306-13.6.

#### 3.09 REMOVAL OF REJECTED AND UNAUTHORIZED WORK

Work which has been rejected shall be remedied or removed and replaced in an acceptable manner as determined by the Owner. Any work done beyond the lines and grades shown on the Plans or established by the Owner or determined by the Engineer to not be of acceptable material quality, or of acceptable workmanship, or any work done without written authority shall be considered as rejected work. Upon order of the Owner, work shall be remedied, removed, or replaced at no expense to the Owner.

#### 1.01 SCOPE

A. This heading covers the furnishing, placement, and compaction of aggregate base material, complete.

#### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Materials Quality
  - 1. Submit material certificates signed by material producer and Contractor certifying that each materials item complies with or exceeds specified requirements.
- C. Materials Source
  - 1. Submit material certificates signed by materials producer and Contractor, identifying material producer by name, location of material producing plant, and type of plant from which material will be produced and delivered.
- D. Submit Owner inspection requests prior to the following a minimum of seventy-two (72) hours in advance:
  - 1. Aggregate base subgrade.
  - 2. Each completed aggregate base course and prior to placing asphalt concrete pavement.

### PART 2 MATERIALS

#### 2.01 AGGREGATE BASE

A. All aggregate base material shall be Class 2, 3/4-inch maximum, conforming to the requirements of Section 26 of the State Standard Specifications.

### PART 3 EXECUTION

#### 3.01 PLACING AGGREGATE BASE

- A. Aggregate base material shall be spread, watered, compacted, and finished in accordance with requirements of Section 26 of the State Standard Specifications and these Technical Specifications.
- B. The Contractor is responsible for coordinating and scheduling all required inspection, sampling, and testing with the Owner provided lab.
- C. Grade approval shall be received from the Owner for subgrade and aggregate base grade.
- D. The subgrade must be firm and unyielding before the base course(s) is placed.
- E. With the Owner's approval, aggregate base may be used to fill areas of the subgrade that are lower than the grade shown.

- F. The finished aggregate base surface shall not vary more than 0.05 foot from the grade shown.
- G. The maximum compacted thickness of any one layer shall not exceed 6-inches. The aggregate base shall be compacted to at least 95 percent of the maximum density, as determined by ASTM D 1557, Procedure C. Field density tests shall be performed in accordance with ASTM D 2922, Direct Transmission Method, using the nuclear gauge, or ASTM D 1556, using the sand cone.
- H. <u>Testing interval:</u> One (1) per 250 linear feet of pipeline trench. Where the trench traverses a roadway, a minimum of one (1) field density test shall be performed for each backfill lift per travel lane.

### 1.01 SCOPE

A. This heading covers the removal, furnishing, placement and compaction requirements for concrete curbs, gutters, sidewalks, and slabs, complete.

### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submit items listed in Technical Specification titled "Concrete Work" paragraph titled "Submittals."
- C. Submit manufacturer's literature, catalog data, and statement of compliance with referenced standards and specifications.
- D. Submit Owner inspection requests prior to the following a minimum of seventy-two (72) hours in advance:
  - 1. Finished subgrades for curbs, gutters, sidewalks, and slabs.

# PART 2 MATERIALS

# 2.01 FORMS

- A. <u>General:</u> Forms shall be as required in Technical Specification titled "Concrete Work." Stakes and braces shall be provided to hold forms securely in place.
- B. <u>Sidewalk Forms:</u> Sidewalk forms shall be 2-inch dressed lumber, straight and free from defects, or standard metal forms. Where short-radius forms are required, 1-inch dressed lumber of plywood may be used.

# 2.02 AGGREGATE BASE COURSE

A. Aggregate base material shall conform to the requirements listed in Technical Specification titled "Aggregate Base."

### 2.03 EXPANSION JOINT FILLER

- A. Unless otherwise shown or specified, premolded expansion joint filler shall be 1/2-inch thick for curbs and 1/2-inch thick for sidewalks.
- B. Expansion joint filler shall conform to the requirements listed in Technical Specification titled "Concrete Work."

# 2.04 CONCRETE

A. Concrete shall conform to the requirements listed in Technical Specification titled "Concrete Work."

TS 13-1

### 2.05 REINFORCING STEEL

A. Reinforcing steel shall conform to the requirements Technical Specification titled "Concrete Work."

#### 2.06 CURING COMPOUND

- A. Curing compound shall conform to the requirements Technical Specification titled "Concrete Work."
- B. Curing compound shall conform to ASTM C 309, Type 2, Class B, and shall be compatible with the local air quality management district's requirements.

#### PART 3 EXECUTION

#### 3.01 GENERAL

A. Excavation, backfill, and compaction shall conform to Technical Specification titled "Trench Excavation and Backfill."

#### 3.02 PAVEMENT REMOVAL

- A. Public Safety
  - 1. The Contractor shall comply with all applicable, State of California, City of Orland, and Glenn County requirements for temporary closures of streets, parking lots, or other areas. The Contractor shall provide barriers, guards, light, signs, temporary bridges, flag persons and watch persons, advising the public of detours and construction hazards. The Contractor shall furnish and install, and upon completion of the work, promptly remove all signs and warning devices. The Contractor shall comply with all the public safety and signing requirements specified in the SSPWC, Section 7 and the California Manual on Uniform Traffic Control Devices, latest edition. Should two or more specifications be in conflict, the more restrictive of the two shall be followed.
- B. Project Cleanliness
  - 1. The Contractor shall ensure that all areas of the site are kept clean of debris and construction materials outside of the region designated for storage and staging. Upon the conclusion of the project, the Contractor shall ensure that all curbs, sidewalks, cross gutters, decorative slab on grade, signs, landscaping drive approaches, etc., are returned to their preconstruction condition and/or new construction status having no marks or material coatings unless designated otherwise. The Contractor shall clean these areas if requested to do so by the Owner prior to the final completion of the project.
- C. Portland Cement Concrete Pavement Cutting Requirements
  - 1. Concrete pavement, cross gutters, curbs and gutters, sidewalks, or driveways, shall be saw cut the full depth in accordance with Technical Specification titled "Clearing, Grubbing, and Demolition" and to the satisfaction of the Owner. 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 three (3) feet of a concrete joint or pavement edge, the concrete shall be removed and replaced to the joint or edge.

- 2. Saw-cutting, removal, and disposal of existing concrete pavement shall be in accordance with Section 39-3 of the State Standard Specifications.
- D. Disposal of Material
  - 1. All pavement and other improvements demolished shall be removed from the site and disposed of in a legal manner per Technical Specification titled "Clearing, Grubbing, and Demolition" and to the satisfaction of the Owner.
- E. Final Pavement Saw Cuts
  - 1. Excavation shall be regular and rectangular in shape and shall be blade-cut or saw-cut, as appropriate to the field conditions through the existing pavements. Cuts shall be made in straight lines. Excavation shall be taken to the limits identified on the site drawings. Excavation material shall be hauled from the job site. Removal shall be considered as Unclassified Excavation.

#### 3.03 PREPARATION OF SUBGRADE

- A. Subgrade shall be excavated and shaped to line, grade, and cross section as necessary to construct concrete curbs, gutters and/or sidewalks per applicable City of Orland's Standard Details (Details 202 through 209) and County of Glenn Subdivision Improvement Standards (S1 through S5). The top 12 inches of subgrade shall be removed and compacted to 92 percent relative density in accordance with ASTM D 1557 in lifts not to exceed 6 inches. All soft material disclosed by excavating shall be removed and replaced with aggregate base as directed by the Engineer.
- B. The finished subgrade shall be within a tolerance of +/-0.02 of a foot of the grade and cross section shown and shall be smooth and free from irregularities at the specified relative density in accordance with ASTM D 1557.
- C. The subgrade shall extend over the full width of the concrete curbs, gutters, and/or sidewalks being constructed.
- D. The Owner's approval of finished subgrades must be received prior to continuance of the work.

### 3.04 PLACING AGGREGATE BASE

A. After the subgrade for curbs, sidewalks, and roadway slabs is compacted and accepted, the Contractor shall place and spread aggregate base material, sprinkle with water, and compact to 95 percent relative density. The surface of the compacted base shall be at the proper level to receive concrete. Curbs and sidewalks shall be underlain by 2-inches of compacted aggregate base material. Where sidewalk abuts a rolled curb and gutter, the thickness of the aggregate base under the sidewalk shall be the same as the thickness placed under the street pavement.

#### 3.05 SETTING FORMS

A. Forms shall conform to Technical Specification titled "Concrete Work." Forms for a face-of-curb shall not have any horizontal joints within 7-inches of the top of the curb. Forms shall be braced to prevent change of shape or movement in any direction resulting from the weight of the concrete. Short-radius curved forms shall be constructed to exact radius. Tops of forms shall not depart from grade line more than 1/8-inch when checked with a 10-foot straightedge. Alignment of straight sections shall not vary more than 1/8-inch in 10 feet.

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#### 3.06 CURB CONSTRUCTION

- A. Jurisdictional Requirements
  - 1. Curbs shall be reconstructed to original line and grade if removed. Curbs shall conform to City of Orland or Glenn County requirements.
- B. Expansion Joints
  - 1. Preformed asphalt-impregnated expansion joints shall be placed in accordance with applicable City or County standards.
- C. Contraction Joints
  - 1. Contraction joints shall be provided in accordance with applicable City or County standards.
- D. Notification
  - 1. The Owner shall be notified at least 72 hours in advance of planned concrete placement.
- E. Concrete Placement and Finish
  - 1. Curbs and gutters shall be screeded to true cross section and grade. The screed shall be operated parallel to the line of the curb. The surface shall then be worked with a wood float as setting progresses, troweled smooth and given a fine brush finish parallel to the line of the curb. Corners shall be rounded. The forms on the face of the curb shall be removed not more than six (6) hours after concrete has been placed. The face shall be brushed with grout, troweled smooth and brushed to match the rest of the curb. The face of the finished curb shall be true and straight and the top surface of the curb and gutter shall be of uniform height and free from irregularities. The surface shall not vary more than 1/8 inch from the edge of a 10-foot straight edge except at grade changes and curves.
- F. Curing
  - 1. Upon completion of the finishing, curing compound shall be applied to exposed surfaces of the curb. Curing shall continue for a minimum of five days.
- G. Backfill
  - 1. Seven days (minimum) after placing the concrete, the curb shall be backfilled with earth free from rocks, 2 inches and larger, and other foreign material. Backfill shall be tamped firmly in place to 95 percent relative density in accordance with ASTM D 1557.
- H. Alignment and Grade
  - 1. Finished curb shall have a uniform grade and alignment. Any section of curb showing abrupt changes in alignment or grade, or is more than 1/4-inch away from its intended location as staked, shall be removed and reconstructed at no additional cost to the Owner.

- I. Protection of Work
  - 1. All concrete surfaces and/or structures shall be protected until the project containing the work is accepted.

### 3.07 SIDEWALK CONSTRUCTION

A. General Requirements

Unless otherwise shown or specified, sidewalks shall be placed in a single layer, 4 inches thick. Walks shall slope 1/4 inch per foot upward from the top of curb. Concrete shall be placed, processed, finished, and cured in conformance with the applicable requirements of ACI 304R, latest edition.

- B. New Sidewalk
  - 1. Unless otherwise shown or specified, where new sidewalk is to abut existing concrete, the existing concrete shall be sawcut to a depth of 2 inches and the concrete chipped out to sound material and a vertical plane surface. The surface shall be cleaned, and a neat cement paste applied just prior to placing the new concrete sidewalk.
- C. Expansion Joints
  - 1. Preformed asphalt-impregnated expansion joints shall be placed in accordance with applicable City or County standards.
- D. Contraction Joints
  - 1. Contraction joints shall be provided in accordance with applicable City or County standards.
- E. Notification
  - 1. The Owner shall be notified at least 72 hours in advance of planned concrete placement.
- F. Concrete Placement and Finish
  - 1. After concrete for slabs or sidewalks has been placed between the side forms, a strikeoff guided by the side forms shall be used to bring the surface to the proper section to be compacted. After screeding off, the surface shall be tamped with a heavy tamper consisting of a grid of metal bars until a layer of mortar not less than 3/8-inch thick has been brought to the surface.
  - 2. The surface shall be rescreeded to a true surface, worked with a wood float as settling progresses and troweled with a steel trowel a sufficient number of times to produce a smooth, hard finish. After troweling, the surface shall be broomed if required. Care shall be taken to obtain a true surface on slabs, especially at walls and joints. Slab surfaces shall not vary more than 1/4 inch at any point from an 8 foot straight edge. The use of topping or dusting with dry cement and shall not be permitted unless it is desired to apply an integral color. No more slabs shall be poured in one day than can be finished to a satisfactory surface.

TS 13-5

- 3. If colored slabs are called for in the Plans, the finish shall be as specified except that the coloring shall be applied in the finished process in strict accordance with the Manufacturer's directions.
- 4. Treads of steps and stairs shall be worked with a wood float to an even surface, troweled to a smooth surface with a steel trowel and given a light brush finish. Use of topping or dry cement and sand will not be permitted. Edges and corners shall be rounded and the tread shall be scored with not less than four grooves the length of all treads near the edge. Forms on risers and other exposed vertical surfaces shall be removed not more than six (6) hours after concrete has been placed. Risers and vertical surfaces shall be brushed with grout and troweled smooth or finished as directed by the Owner.
- G. Curing
  - 1. Concrete slabs and walks shall be covered with "Sisal-Kraft" paper, sand, or sawdust as soon as they are hard enough to walk on and shall be kept continuously wet for ten (10) days after pouring. Care shall be taken to prevent exposed slabs from becoming stained.
  - 2. Alternatively, upon completion of the finishing, curing compound shall be applied to exposed surfaces of the sidewalk. Curing shall continue for a minimum of five days.

#### 3.08 INSPECTION AND TESTING

A. Inspection and testing shall be in accordance with Technical Specification titled "Trench Excavation and Backfill" and Technical Specification titled "Concrete Work."

#### 3.09 REMOVAL OF REJECTED AND UNAUTHORIZED WORK

A. Work which has been rejected shall be remedied or removed and replaced in an acceptable manner as determined by the Owner. Any work done beyond the lines and grades shown on the Plans or established by the Owner or determined by the Owner to not be of acceptable material quality, or of acceptable workmanship, or any work done without written authority shall be considered as rejected work. Upon order of the Owner, work shall be remedied, removed, or replaced to the satisfaction of the Owner at no expense to the Owner.

TS 13-6

### 1.01 SCOPE

A. This heading covers concrete work, complete.

#### 1.02 SUBMITTALS

A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, SSPWC Subsection 3-8, ACI 318, and as specified herein.

#### B. <u>Placement Drawings</u>

- 1. Concrete placement drawings for each individual placement shall be submitted, indicating location and sizes of pipe sleeves, conduits, inserts, reglets, anchor bolts, openings, recesses, construction joints, expansion joints, and other embedded items. Placement drawings shall be coordinated with drawings. Placement drawings shall show where each mix will be used.
- 2. Each drawing shall show only one placement. Match-lines shall reference adjoining placement drawings, and an index shall be provided on each sheet showing the location of the placement in the overall structure.
- 3. The Contractor shall submit a copy of the sequence of placement in advance of actual placement.
- C. Plan for hot weather concreting procedures; including procedures for transporting, placing, protecting, curing, and monitoring temperature of concrete during hot weather.
- D. Plan for cold weather concreting procedures, including procedures for transporting, placing, protecting, curing, and monitoring temperature of concrete during cold weather. Include procedures to be implemented upon abrupt changes in weather conditions or equipment failures. Include procedures for protecting the subgrade from frost, and for preventing the accumulation of ice or snow on reinforcement or forms prior to placement.
- E. Mix design with proof of design by laboratory 7-day and 28-day compressive tests, or test reports of 7-day and 28-day compressive tests of the mix where the same mix was used on two previous projects, shall be submitted in writing for review by the Owner at least 30 days before placing of any concrete. Mixtures shall be proportioned in accordance with ACI 211.1. The submittal of mixture proportions and supporting information shall follow the guidelines given in ACI 211.5R. The submittal shall include the laboratory mix data used for selection of mixture proportions.
- F. Certificate that cement used in the concrete complies with ASTM C150 and these specifications shall be submitted.
- G. Certificate that fly ash conforms to ASTM C618, Class F shall be submitted.
- H. <u>Aggregates:</u> Certificate of compliance with ASTM C33 shall be provided. Weathering region limits of coarse aggregates: severe, moderate, or negligible shall be stated. Basis of determining that potential reactivity is negligible shall be stated.
- I. <u>Concrete admixtures:</u> Manufacturer's certificate of compliance with these specifications shall be provided.

- J. <u>Epoxy Bonding Compound:</u> Manufacturer's specific instructions for use shall be provided.
- K. <u>Nonshrink Grout:</u> Manufacturer's certificate of compliance with these specifications and specific instructions for use shall be provided.
- L. Statement of Qualifications:
  - 1. Mix designer.
  - 2. Batch plant.
  - 3. Contractor's resident superintendent for concrete placement.
- M. Ready Mix Concrete
  - 1. Delivery tickets or weighmasters certificate per ASTM C94, including weights of cement and each size aggregate, volume of water in the aggregate, and volume of water added at the plant shall be provided. The volume of water added on the job shall be written on the ticket or certificate.
- N. Precast Concrete Vaults
  - 1. Shop drawings and placement drawings shall be submitted for all precast concrete vaults to be installed.
- O. Concrete Rebar Scan Plan
  - 1. Plan for scanning and locating existing rebar embedded within structural concrete components of the County Road 19 and County Road 200 Bridge Crossings that will be cored through, drilled through, sawcut, or will have any other work performed that may compromise the integrity of the concrete.

### 1.03 QUALITY ASSURANCE AND TESTING

- A. Mix designer shall be a licensed professional engineer registered in the State of California or a CalTrans approved concrete mix designer, with a minimum of 5 years of experience in the design of concrete mixes.
- B. Batch plant shall be currently certified by the National Ready Mixed Concrete Association.
- C. During progress of the work, compression tests shall be made at the discretion of the Engineer. Samples taken of the concrete shall use the molded cylinder method in accordance with ASTM C31 and ASTM C39. Unit weight, slump, air content, and temperature measurements shall also be made at the discretion of the Engineer in accordance with ASTM C138, ASTM C143, ASTM C231, and ASTM C1064, respectively. Materials for the samples will be furnished at the expense of the Contractor. Testing will be done by the Owner or authorized laboratory at the expense of the Owner.

# PART 2 MATERIALS

#### 2.01 PORTLAND CEMENT

A. Portland cement shall be Type II and conform to ASTM Specification C150. All cement shall be furnished from one source and protected from moisture until used.

# 2.02 FLY ASH

- A. Fly ash shall conform to ASTM C 618, Class F.
- B. Fly ash shall be stored and handled as required for Portland cement and shall be protected from moisture.

# 2.03 CONCRETE AGGREGATES

#### A. General

- 1. Concrete Aggregate shall conform to ASTM Specification C33. The sieves used in Sieve Analysis shall be square mesh wire cloth. Both coarse and fine aggregate shall be tested for soundness by ASTM Method C88 when in the judgment of the Owner such tests are necessary to determine the quality of the materials.
- 2. Fine Aggregate shall consist of natural sand having hard, strong and durable particles. It shall not contain more than 2 percent by weight of clay, shale, schist, alkali, or other deleterious substances. The grading of fine aggregate shall range uniformly from coarse to fine.
- 3. Coarse Aggregate shall consist of clean, hard, sound crushed rock or washed gravel. It shall not contain more than 2 percent by weight of clay, shale, schist, alkali, or other deleterious substances. The grading of coarse aggregate shall range uniformly from coarse to fine.
- 4. Storage: Fine and coarse aggregate shall be stored and measured separately. Aggregate shall be stored on the job so that various sizes do not become intermixed. They shall be protected from contamination with dust, dirt, or other foreign materials.
- 5. Moisture Content of aggregate shall be such that no visible separation of moisture and aggregate will take place during transportation from the proportioning plant to the point of mixing. Aggregate containing excess moisture shall be stockpiled prior to use and sufficiently dried.
- 6. Variations in moisture content shall not exceed one percent of the weight of the aggregate in a saturated surface dry condition. Variations in specific gravity of any group of sizes shall not exceed one percent. Variations in grading of separate groups of sizes of aggregate shall not exceed 5 percent. Variations exceeding these maximums shall constitute cause for delaying the use of the materials until batch weights and mixing water can be adjusted.
- 7. <u>Aggregate Size:</u> The primary size of aggregate specified and used on any project shall be the maximum consistent with the dimensions and form of the section being placed, the location and spacing of the reinforcing bars, and with the method of compaction, but shall not be more than 1 inch.

### 2.04 WATER AND ICE

A. Water and ice shall be clean and free of oil, acid, alkali, organic matter or other deleterious substances and conform to applicable provisions of ASTM C94.

TS 14-3

### 2.05 CURING COMPOUND

### A. General

1. Curing compound shall conform to ASTM C 309, Type 2, Class B, and shall be compatible with required finishes and coatings.

### B. Manufacturers

1. Curing compound shall be Kure-N-Seal manufactured by BASF or Super Diamond Clear 350 manufactured by Euclid Chemical Co.

# 2.06 REINFORCING STEEL

- A. Bars shall be of intermediate grade steel and shall conform to ASTM A615. All bars shall be deformed and deformations shall conform to ASTM A615.
- B. Welded Wire Fabric or Mesh shall conform to ASTM A185.

# 2.07 ADMIXTURES

- A. General
  - 1. Admixtures shall be used only where specifically required or where written approval has been granted by the Owner.
  - 2. Furnish each admixture from a single manufacturer.
- B. Air-Entraining Admixture
  - 1. Concrete may contain an air-entraining admixture which shall conform to ASTM C 260.
  - 2. Admixture shall be Grace Construction Products, Master Builders, Sika, or equal.
- C. Water-Reducing Admixture
  - 1. Concrete may contain a water-reducing admixture which shall conform to ASTM C 494, Type A or Type D, and shall be compatible with the air-entraining admixture. The amount of admixture added to the concrete shall be in accordance with the manufacturer's recommendations.
  - 2. Admixtures shall be Grace Construction Products, Master Builders Pozzolith polymertype normal setting, Sika, or equal.
- D. Accelerant
  - 1. Concrete for thrust blocks may contain an accelerant which shall conform to ASTM C 494, Type C or Type E, and shall be compatible with any other admixtures used. The amount of admixture added to the concrete shall be in accordance with the manufacturer's recommendations.
  - 2. Admixtures shall be Grace Construction Products, Master Builders, Sika, or equal.

TS 14-4
- E. Admixture Restrictions
  - 1. Accelerating water-reducing admixtures or any other type of admixture that contains chlorides or other corrosive elements shall not be used in any concrete.

#### 2.08 NON-SHRINK GROUT

- A. Non-shrink grout mortar shall be non-metallic cementitious grout and shall meet the requirements of ASTM C 1107.
- B. Acceptable products shall be Masterflow 928 Grout by Master Builders, Five Star Grout by Five Star Products, or approved equal.

#### 2.09 ORDINARY TYPE GROUT (DRY PACK)

A. Ordinary type grout shall consist of one-part Portland cement to two parts sand (100 percent passing a No. 8 sieve). Sufficient water shall be added to produce damp formable consistency.

#### 2.10 BONDING COMPOUND

- A. Portland Cement
  - 1. Neat Portland cement or a blend of neat Portland cement and fine aggregate filler with water to a creamy consistency.
- B. Epoxy
  - 1. Manufacturer's certifications as to suitability of product to meet job requirements with regard to surface, pot life, set time, vertical or horizontal application, and forming restrictions shall be provided.
  - 2. Bonding compound shall be Concresive 1001 LPL as manufactured by Adhesive Engineering Company or approved equal.

#### 2.11 CONCRETE MIX DESIGN

- A. General
  - 1. Concrete mix design shall conform to ASTM C 94 and ACI 318, except as modified by these specifications.
- B. Provide the following conventional concrete for use in the Work:
  - 1. Structural concrete: 4,000 psi at 28 days, for general use in structural reinforced concrete elements. Minimum cementitious content for structural concrete shall be 615 lbs per cubic yard.
  - 2. Class A (civil site concrete): 6 sacks of cement per cubic yard of concrete with a minimum compressive strength of 3,000 psi at 28 days, to be used for civil site works (fire hydrant bollard foundations, etc.)
  - 3. Class B (street surface improvements): 5 sacks of cement per cubic yard of concrete with a minimum compressive strength of 2,500 psi at 28 days, to be used for valve box collars, curbs, gutters, sidewalks, and slabs.

TS 14-5

- 4. Class C: 4.2 sacks of cement per cubic yard of concrete with a minimum compressive strength of 2,000 psi at 28 days, to be used for thrust blocks, pipe caps, and pipe encasements.
- 5. Where unreinforced concrete class is not shown or specified, Class A concrete shall be used.
- C. Fly Ash
  - 1. Fly ash shall not be used in the mix as a partial substitute for cement, unless specifically requested in the mix requirements. Class A, B, and C concrete shall contain 20 to 25 percent fly ash, by weight of total cementitious material unless otherwise approved by the Owner.
- D. Air Content
  - 1. Air content as determined by ASTM C231 shall be 4% +/- 1%.
- E. Water-Cement Ratio
  - 1. Maximum water-cement ratio shall not exceed 0.44 by weight.
- F. Slump
  - 1. Slump shall be measured in accordance with ASTM C143. Slump shall be as 4 inches + 1 inch.
- G. Aggregate Size
  - 1. Aggregate shall be 1-inch maximum for all structural and site work concrete per ASTM C33 gradations.

#### 2.12 PUMPED CONCRETE DESIGN MIX

A. 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 volume of the coarse aggregate.

# 2.13 WORKABILITY

- A. General
  - 1. Concrete shall be of such consistency and composition that it can be worked readily into the forms and around the reinforcement without excessive spading and without permitting the materials to segregate or free water to collect on the surface. The proportions shall be adjusted to secure a plastic, cohesive mixture, and one which is within the specified slump range.
- B. Aggregate
  - 1. To avoid unnecessary changes in consistency, aggregate shall be obtained from a source with uniform quality, moisture content, and grading. Materials shall be handled in such a manner that variations in moisture content will not interfere with production of concrete of the specified degree of uniformity.

#### 2.14 EXPANSION JOINT FILLER

A. Expansion joint filler shall be of the preformed non-extruding type and shall conform to ASTM D545, Type V, bituminous fiber, and shall be the full depth of the abutting concrete.

## 2.15 PRECAST CONCRETE VAULTS

#### A. General

- 1. Precast reinforced concrete vaults shall comply with ASTM C478.
- 2. Lifting holes, if used, shall be tapered, and no more than two shall be cast in each section.
- 3. Steel lid shall be bolted down and multiple lid segments shall not exceed 24 inches in length.
- 4. Steel lid shall be hinged on one side and should be able to lock in the open position.
- 5. Mark date of manufacture and name or trademark of manufacturer on inside of vault.
- 6. Vaults exceeding three (3) feet in depth shall contain galvanized (ASTM A123) steps.
- 7. Vault bottom shall be a minimum of 6 inches of crushed gravel.
- 8. Vault bottom shall include a galvanized wire mesh with a minimum of 0.063-inch diameter wire and 1/2-inch by 1/2-inch clear opening size. The wire mesh shall be bolted to bottom of concrete vault as shown in drawings with 0.25-inch by 1.25-inch Tapcon Blue Climaseal Hex Head Screws and 0.75-inch washers at 6-inch spacings.
- B. Vault Design Load
  - 1. All vault components shall be designed for AASHTO HS-20-44 continuous loading per standard specifications for highway bridges and site soil conditions. The live load shall be that which produces the maximum shear and bending moments in the structure.
- C. Concrete
  - 1. Precast reinforced concrete vaults shall be constructed and comply with this Section.
- D. Joints
  - 1. Joints between vault components shall be tongue and groove type and shall be sealed with a joint sealing compound, Conseal CS-102B, or approved equal.
- E. Manufacturers
  - 1. Precast reinforced concrete vaults shall be manufactured by Jensen Precast, Christy, or approved equal.

TS 14-7

#### PART 3 WORKMANSHIP

#### 3.01 REINFORCING STEEL

#### A. Placement

- 1. Unless an exception is made in writing by the Owner, the Contractor shall submit for approval detailed drawings showing bending and placing of all reinforcing steel and shall not begin work until the drawings have been approved by the Owner.
- 2. Steel reinforcement shall be accurately placed and positively secured and supported by concrete blocks, metal chairs, spacers, or by metal hangers. The clear spacing between parallel bars shall not be less than 1.50 times the nominal diameter for round bars, but in no case shall the clear distance be less than 1.50 inches nor less than 1.33 times the maximum size aggregate. Reinforcing steel shall be in position before concreting is begun.
- 3. Steel shall not be bent nor straightened in a manner that will injure the materials. Kinked bars shall not be used. Heating of steel for bending shall not be permitted.
- 4. All steel dowels must be placed and securely anchored before concrete is poured.
- 5. Reinforcing shall not be placed in slabs and beams until after the concrete in the walls and columns has been placed, unless specifically indicated on drawings.
- B. Splicing
  - 1. In slabs, beams, and girders, splices at the points of maximum stress shall be avoided. Bars in horizontal members shall have a maximum lap at splices sufficient to develop the strength of the bars. Wherever possible, splices of adjacent bars shall be staggered. Unless stress governs, the splice of wire fabric shall be at least one mesh wide.
  - 2. Spliced bars in walls may be either separated or wired together. Deformed bars shall be lapped 24 bar diameters.
- C. Cleaning Reinforcement
  - 1. Steel shall be cleaned of any oil, grease, rust, concrete or other deleterious substances before it is placed in the forms. Any deleterious substances that get on the steel after placing shall be removed before pouring concrete.

#### 3.02 CONCRETE PROPORTIONING AND MIXING

#### A. General

- 1. Batch, mix, and deliver to placement site in accordance with ASTM C94.
- B. Amount of Water and Slump Test
  - 1. The amount of water required for the proper consistency of concrete shall be determined by means of the slump test, made in accordance with ASTM Method C143.
  - 2. The maximum allowable slump shall be as follows:

- a. Thin sections and columns Not more than 5"
  b. Heavy sections, footings & slabs Not more than 3"
  c. Concrete placed under water Not more than 8", Not less than 6"
- 3. The amount of water may be varied in accordance with the dampness of the materials and the requirements of the workability of the aggregate within the limits of the slump tests given above.
- C. Measuring Water
  - 1. The equipment for measuring and supplying the water to the mixer shall be so constructed and arranged that the amount of water to be added to the mixture can be measured positively and that the predetermined quantity of water required can be discharged rapidly in one operation into the mixing drum. The equipment shall be designed so that water from the source of supply cannot enter the measuring tank while the water is being discharged from the measuring tank into the mixer. Tanks or other equipment for measuring and discharging water into the mixer shall be sufficiently accurate that the amount of water delivered to the mixer for any batch shall not vary more than one percent from the required quantity of water for any position of the mixer. The tanks or other equipment shall be arranged to permit checking the amount of water delivered by discharging into measured containers.
- D. Job Mixing
  - 1. The capacity of the mixer shall be adequate to handle one or more full sack batches. No split sack batches will be permitted, unless all materials are weighed. At no time shall the mixer be loaded beyond its capacity. The capacity of the mixer shall be considered to be the rated capacity as given in the manufacturer's catalog, provided that a quantity equal to the rated capacity can be thoroughly mixed in the prescribed time period and that there is no loss of ingredients during the mixing. Each batch shall be mixed not less than 1.50 minutes after all ingredients are in the mixer and until the mixture is uniform and homogeneous. It shall be completely discharged. The peripheral speed of concrete mixing drums shall be approximately 200 feet per minute. The mixer shall be equipped with an automatic time lock on the discharge control arranged to start the time cycle on the stroke of the material skip or on the closing of the hopper gate.

# E. Transit Mixing

- 1. Transit-mixed concrete shall be in accordance with ASTM C94 and be of not less than 10 minutes at a peripheral drum speed of approximately 200 feet per minute. Mixing shall be continued until discharge is complete. At least three minutes of the mixing period shall be at the job site. The transit mixer shall be equipped with water measuring devices consisting of either accurately calibrated water tanks or water meters. Transit-mixed concrete will be rejected if not placed within 1.50 hours after water is first added to the batch.
- 2. Should the Contractor elect to utilize transit mixing equipment he shall make advance arrangements to prevent delays in delivery and placing of the concrete. An interval of more than 45 minutes between any two consecutive batches or loads, or a delivery and placing rate of less than 8 cubic yards of concrete per hour, shall constitute cause for shutting down the work for the remainder of the day, and if so ordered by the Owner, the

TS 14-9

Contractor shall make, at his own expense, a construction joint at the location and of the type directed by the Owner in the concrete already placed.

- F. Forms
  - 1. Forms shall conform to the shape, lines and dimensions called for on the Plans and shall be substantial and mortar tight. All vertical surfaces shall be formed, except where specifically authorized to the contrary. Temporary openings at the bottom of the wall forms and temporary openings at the base of all columns and piers shall be provided as required for cleaning and to facilitate inspection.
  - 2. Drip beads, feature grooves and other concrete details shall be carefully formed with surfaced material which shall be thoroughly coated with oil or other approved products before concrete is poured. Method of forming shall be selected for ease of stripping without damage to details. All exterior corners shall be chamfered 3/4 inch unless otherwise specifically shown.
  - 3. Bolts or form clamps shall be of sufficient strength and number to prevent spreading of forms. They shall be of a type which can be entirely removed or cut back one inch below the finished surface of the concrete. All forms for outside surfaces shall be constructed with stiff wales at right angles to the studs and all form clamps shall extend through and fasten to such wales. Forms shall be so constructed that side forms where surface finishing is required can be removed without disturbing supporting forms.
  - 4. Where woodwork comes into contact with concrete, proper anchors shall be provided. End studs of frame walls shall be bolted and dovetailed nailing blocks shall be provided for trim and other woodwork. Anchors in jambs of openings shall be spaced not more than two feet on centers.
  - 5. Anchor bolts shall be positively positioned and anchored in the forms with templates and checked by the Owner before concrete is poured.
  - 6. If there is any question regarding the strength of forms, the recommendations of the manufacturer of the form ties shall be followed.
  - 7. Non-supporting forms may be removed in 48 hours and supporting forms in not less than 21 days unless approval for earlier removal is granted by the Owner. Forms shall be carefully removed so as not to endanger the structure or damage the surface.

#### 3.03 CONCRETE CONVEYING AND DEPOSITING

- A. Concrete shall be conveyed from the mixer to the place of final deposit by methods which will prevent segregation or loss of material. Concrete shall not be deposited in a manner which shows segregation to occur, and shall be deposited as nearly as practicable in its final position to avoid segregation during rehandling.
- B. No concrete which has partially hardened or been contaminated by foreign material shall be deposited on the work, nor shall retempered concrete be used. When concreting is started it shall be carried on as a continuous operation until the section is completed, maintaining the top surface level.
- C. All concrete shall be compacted with mechanical vibrators in a manner satisfactory to the Owner. At least two satisfactory vibrators shall be on the job during every pour and more if required by the Owner. If it is deemed necessary by the Owner, surfaces that are to be exposed shall be spaded and hammered to obtain a good surface. Concrete shall not be permitted to fall from a

height greater than 6 feet without the use of adjustable length pipes or "elephant trunks." The use of chutes in conveying and depositing concrete will be allowed only at the discretion of the Owner, and wherever they are used, they shall be laid at an inclination that will permit the flow of concrete of the required consistency. Where necessary to prevent separation, chutes shall be provided with baffle boards or a reversed section at the outlets. Columns shall be poured through pipes of adjustable length and not less than 6 inches in diameter. The use of additional water in mixing the concrete to promote free flow in chutes of low inclination will not be allowed.

D. Where it is necessary to deposit concrete under water, concrete shall be placed by use of a tremie tube. Care shall be exercised to see that the lower end of the tremie tube does not rise above the surface of the concrete during the pour, to avoid contamination with water. Depositing of concrete under water shall be permitted only with the approval of the Owner, where it is not possible to de-water.

## 3.04 PUMPING CONCRETE

- A. Equipment Capacity Requirements
  - 1. Pump size shall be determined by the rate of concrete placement, length of delivery pipe or hose, aggregate size, mix proportions, vertical lift, and slump of concrete.
  - 2. Minimum inside diameter of pipe or hose shall be based on the maximum aggregate size as follows:
    - a. 1-inch max aggregate: Three-inch min ID.
    - b. Larger aggregate sizes: as directed by the Owner.
- B. Disallowance of Aluminum Pipe
  - 1. Aluminum pipes shall not be used for delivery of concrete to the forms.
- C. Priming
  - 1. Before pumping is started, the delivery pipe or hose shall be primed by pumping mortar through the line using five gallons of mortar for each 50 feet of delivery line. Mortar shall be pumped to waste and not deposited in the forms.

# 3.05 COLD WEATHER WORK

- A. Concrete shall not be mixed nor placed while the atmospheric temperature is at or below 35 degrees Fahrenheit unless means are employed to heat the aggregate and water, and satisfactory provisions have been made for protecting the work. All concrete shall be effectively protected from frost action for a period of five days after placing and will not be accepted before the expiration of a thirty day period during which the temperature of the concrete does not fall below 40 degrees Fahrenheit.
- B. The concrete shall be maintained at a temperature of at least 50 degrees Fahrenheit for not less than 72 hours after placing or until it has thoroughly hardened.
- C. The temperature of the concrete as it leaves the mixer shall not be less than 50 degrees Fahrenheit, nor more than 95 degrees Fahrenheit. Upon written notice from the Owner, all concrete which may have become damaged by frost action shall be replaced by the Contractor at his own expense.

## 3.06 BONDING TO EXISTING CONCRETE

A. Existing concrete to which new concrete is to be bonded shall have the contact surfaces coated with materials listed in Part 2 of this section. The method of preparation and application of the bonding compound shall conform to the manufacturer's printed instructions and recommendations for specific application for this project.

## 3.07 CONSTRUCTION JOINTS AND EXPANSION JOINTS

- A. Construction joints in structural concrete shall be level or vertical and shall be of the type and location as the Owner directs or as shown on the Plans. Joints not indicated on the Plans shall be so made and located as to least impair the strength of the structure and shall conform to the typical details.
- B. The horizontal surface of all construction joints shall be cleaned and roughened by removing the entire surface and exposing clean aggregate solidly embedded in mortar matrix in accordance with the following procedure. The contact surface must be thoroughly cleaned by chipping or sand blasting the entire surface not earlier than 5 days after initial pour or by an approved method that will assure equal bond such as a thorough hose washing of the surface not less than 2 nor more than 4 hours after the concrete is placed (depending on setting time). All wash and chalklike material shall be entirely cleaned from the surface.
- C. In the event that the contact surface becomes coated with earth, sawdust, etc., after being cleaned, the entire surface so coated shall be recleaned.
- D. All construction joints shall be slushed with neat cement grout immediately ahead of the pour.
- E. Water stops shall be installed in construction joints where shown on the Plans. Where no construction joint is shown on the Plans, but is permitted by the Owner, water stops shall be installed as directed by the Owner.
- F. Unreinforced slabs, walks, curbs, etc., shall have construction joints at not to exceed 12-foot centers and expansion joints at not to exceed 48-foot centers. Reinforced slabs, walks, curbs, etc., shall have construction joints at not to exceed 20-foot centers and expansion joints at 40-foot centers. Expansion joint material shall be placed along all walls and around each column and projection.

#### 3.08 CONCRETE FINISHING

- A. Structures
  - 1. Forms shall be removed as soon as permissible and, immediately thereafter, tie rod holes, rock pockets, and other defects shall be chipped to expose sound aggregate and mortar and then shall be dashed with neat cement paste and dry packed with moistened 1 to 2 cement sand mortar thoroughly tamped in.
  - 2. After patches have thoroughly hardened, surfaces that are to be exposed or painted in the finished structures shall be rubbed mechanically or by hand with carborundum stones to eliminate traces of forms and patch work. A brush coat of thin cement mortar consisting of one part cement and one part sand that will pass a No. 16 screen or at the option of the Owner a neat cement wash shall be applied if necessary to give a uniform appearance. In either case, five percent calcium chloride shall be used. When the cement film has set sufficiently so that the sand particles and cement will not draw out of surface pin holes, but before final set has taken place, the entire surface shall be rubbed

TS 14-12

with fine carborundum stones (No. 25 to No. 30) until a smooth, even surface of even texture, color and appearance is obtained. No greater amount of mortar shall be applied in advance of rubbing than can be completely rubbed before final setting takes place. Immediately following the rubbing process, the finished surface shall be thoroughly washed with water.

3. Finish fiber reinforced concrete in accordance with the fiber manufacturer so as to minimize visible fibers at the surface of the concrete.

#### 3.09 SLABS, WALKS, STEPS, CURBS, AND GUTTERS

A. Placement, cure, and finish requirements shall be in accordance with Technical Specification titled "Concrete Curbs, Gutters, and Sidewalks."

## 3.10 CURING

- A. All concrete shall be protected from injury and shall be kept continuously wet for a period of ten (10) days after pouring.
- B. Alternatively, curing compound shall be applied to exposed concrete surfaces. Curing shall continue for a minimum of five days.
- C. Curing requirements for curbs, gutters, slabs, and sidewalks shall be in accordance with Technical Specification titled "Concrete Curbs, Gutters, and Sidewalks."

# 3.11 PRECAST CONCRETE VAULT

A. Precast concrete vault shall be installed per the SSPWC, Section 216.

#### 3.12 CUTTING, BORING, OR DRILLING THROUGH EXISTING STRUCTURAL CONCRETE

- A. Contractor shall do its best to avoid or limit damage to existing concrete and rebar of structural concrete components such as, but not limited to, the abutments and headwalls of County Road 19 and County Road 200 bridges.
- B. A Concrete Rebar Scan Plan must be submitted to and approved by the Engineer before any work that may cause damage to the integrity of the structural concrete components can occur. Such work includes, but is not limited to, cutting, boring, or drilling through structural concrete.



TS 14-14

Issued For Bid August 2023 Concrete Work

#### PART 1 GENERAL

#### 1.01 SCOPE

A. This section covers protective coatings, complete.

#### 1.02 DEFINITIONS

- A. The term "paint," "coatings," or "finishes" as used herein, shall include surface treatments, emulsions, enamels, paints, epoxy resins, and all other protective coatings, excepting galvanizing or anodizing, whether used as a pretreatment, primer, intermediate coat, or finish coat.
- B. The term "DFT" means minimum dry film thickness, without any negative tolerance.

#### 1.03 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Coating Materials List
  - 1. Copies of a coating materials list showing the manufacturer and the coating number, keyed to the coating systems herein.
  - 2. Submit prior to or at the time of submittal of samples.
- C. Paint Manufacturer's Information. For each coating system to be used, include:
  - 1. Paint Manufacturer's data sheet for each product proposed, including statements on the suitability of the material for the intended use.
  - 2. Technical and performance information that demonstrates compliance with the system performance and material requirements.
  - 3. Paint Manufacturer's instructions and recommendations on surface preparation and application.
  - 4. Colors charts and samples/chips available for each product (where applicable).
  - 5. Compatibility of shop- and field-applied coatings (where applicable).
  - 6. VOC compliance.
  - 7. Material Safety Data Sheet for each product used.
- D. Coating applicator(s) qualifications and references.

#### 1.04 AIR QUALITY REQUIREMENTS

A. Coating materials, shop coating, and field coating shall comply with all applicable Glenn County Air Pollution Control District rules and regulations.

#### 1.05 SURFACES NOT REQUIRING PAINTING

- A. The following areas or items are not required to be protective-coated:
  - 1. Concrete Floors.

- 2. Masonry.
- 3. Portions of metal embedded in concrete.
- 4. Stainless steel, brass, bronze, chrome, or aluminum.
- 5. Machined surfaces (intended for a registered fit).
- 6. Grease fittings.
- 7. Glass.
- 8. Equipment nameplates.
- 9. Ferrous metal to be galvanized
- 10. Switch plates, fixtures and certain other manufactured items furnished with an undamaged factory baked enamel finish.

## PART 2 MATERIALS

#### 2.01 GENERAL

- A. All materials, supplies, and articles provided shall, wherever practicable, be the standard product of recognized, reputable manufacturers. The standard products of manufacturers, other than those specified, will be accepted when it is proved to the satisfaction of the Owner that they are equal in composition, durability, usefulness, and convenience for the purpose intended. In any case, the Contractor shall demonstrate, to the satisfaction of the Owner, that all paint materials comply fully with the Specifications.
- B. All materials shall be delivered to the job in the manufacturer's unbroken packages with labels indicating the brand and contents of each container.

# C. Colors shall be as selected by the Owner from color chips supplied by the Contractor prior to the Contractor ordering the paint.

D. Alternate coats of paint shall be tinted to ensure that all surfaces are properly coated with the specified number of coats. Unless otherwise specified, the colors of all undercoats shall match the color of the finish coat as nearly as practicable.

#### 2.02 SPECIALTY ITEMS

- A. Surfaces shall be coated as described below:
  - 1. <u>Valve Can & Test Box Lids:</u> Valve can and test box lids shall be coated per System A.
  - 2. <u>Buried Items:</u> Buried flanges, nuts and bolts, flexible pipe couplings, exposed rebar from thrust blocks, and valve boxes shall be coated per System B unless otherwise specified in the particular specifications for these items.
  - 3. <u>Above Ground Structural Steel and Structural Steel in Vaults:</u> Above ground structural steel or structural steel located in vaults and steel structures shall be coated as described in the exposed metal coating system sections.
  - 4. <u>Pipe Supports:</u> All non-galvanized and non-stainless steel pipe supports in vaults shall be coated the same as the adjacent piping.

TS 15-2

## 2.03 COATING SYSTEMS

- A. Material Sources
  - 1. Each of the following manufacturers is capable of supplying many of the industrial coating materials indicated herein.
  - 2. Where manufacturers and paint numbers are listed, it is to show the type and quality of coatings that are required. Proposed substitute materials will be considered as indicated above.
  - 3. All industrial coating materials shall be materials that have a record of satisfactory performance in industrial plants, manufacturing facilities, and water and wastewater treatment plants.
  - 4. Coating materials for coating system shall be the products of a single manufacturer.
  - 5. <u>Manufacturers:</u> Tnemec Company, 3M, or equal.
- B. System A Exposed Metal (Atmospheric Weathering Environment)
  - 1. Shop coat DFT = 5-7 mils, Tnemec Series V69 Hi-Build Epoxoline II, PPG Amerlock 2 High Solids Epoxy, or approved equal.
  - 2. Finish field coats (one or more, DFT = 3-5 mils), Tnemec Series 1095, Endura-Shield II, PPG Durethane DTM Urethane Mastic 95-3300, or approved equal.
  - 3. Total system DFT = minimum of total paint system of 8 mils.
- C. System B Buried Metal Coating Systems
  - 1. <u>Type:</u> Low VOC epoxy coating. A total dry-film consisting of the combined thickness of both a prime coat and finish coat is described herein. The total minimum dry-film thickness of this system shall be 24 mils.
  - 2. <u>Service Conditions:</u> Shall be used to coat buried metal including but not limited to flanges, bolts and nuts, fittings, structural steel, and miscellaneous hardware.
  - 3. Surface Preparation: SSPC SP-10 with a 2 mil angular anchor profile.
  - 4. <u>Coating:</u> Apply prime coat to a dry-film thickness of 8-10 mils. Apply two finish coats, each 8-10 dry-film thickness, to achieve the total dry-film thickness. The coating material shall be the same material as the prime coat.
  - 5. <u>Manufacturers:</u> Tnemec, Series V69 Hi-Build Epoxoline II, or equal.
- D. System C Fusion-Bonded Epoxy Lining and Coating Steel Pipes
  - 1. <u>Type:</u> Thermosetting powdered epoxy coating in accordance with AWWA C213.

TS 15-3

- 2. <u>Service Conditions:</u> Shall be used to coat interior and exterior surfaces of ferrous metal pipe.
- 3. <u>Surface Preparation:</u> In accordance with AWWA C213.
- 4. <u>Coating:</u> Unless otherwise specified, apply to a minimum total dry-film thickness of 12 mils in accordance with AWWA C213 and the manufacturer's recommendations. In addition to the FBE coating: 1) Where exposed to the atmosphere, "System A" finish coat is required. 2) Where located in a vault, "System A" shop and finish coats are required.
- 5. <u>Manufacturers:</u> 3M, Scotchkote 134, or equal.

- E. System D Fusion-Bonded Epoxy Lining and Coating Valves and Couplings
  - 1. <u>Type:</u> Thermosetting powdered epoxy coating in accordance with AWWA C213 and AWWA C550, as applicable.
  - 2. <u>Service Conditions:</u> Shall be used to coat interior and exterior surfaces of ferrous metal valves and couplings.
  - 3. <u>Surface Preparation:</u> In accordance with AWWA C213 and C550, as applicable.
  - 4. <u>Coating:</u> Unless otherwise specified, apply to a total minimum dry-film thickness of 12 mils in accordance with AWWA C213 and C550, as applicable, and the manufacturer's recommendations. In addition to the FBE coating: 1) Where exposed to the atmosphere, "System A" finish coat is required. 2) Where located in a vault, "System A" field and finish coats are required.
  - 5. <u>Manufacturers:</u> 3M, Scotchkote 134, or equal.
- F. System E Public Hydrants
  - <u>Type:</u> Water-based low Volatile Organic Compound (VOC) acrylic coating. Thinners, cleaners, driers, and other additives shall be as recommended by the paint manufacturer. A total dry-film consisting of the combined thickness of both a prime coat and finish coat is described herein. The total dry-film thickness of this system shall be 5 mils.
  - 2. <u>Surface preparation:</u> Remove oil, grease and chalking. Abrade existing paint and visible rust areas. Do not sandblast or prepare more surface area than can be coated in one day. Surface preparation shall conform to the Society for Protective Coatings (SSPC) specifications as follows: SP-1 Solvent Tool Cleaning, SP-2 Hand Tool Cleaning, and SP-3 Power Tool Cleaning
  - 3. <u>Color:</u> Yellow.
  - 4. <u>Prime Coat:</u> Apply to a dry-film thickness of 2 to 3 mils. Primer shall be synthetic. Approved manufacturers for previously painted surfaces include: Tnemec Series 1028 Enduratone.
  - 5. <u>Approved manufacturers for bare metal surfaces include:</u> Tnemec Series 94-H20 Hydrozinc or equal.
  - 6. <u>Finish Coat:</u> Apply to a dry-film thickness of 3 to 4 mils. The finish coat shall be applied in the field just prior to final inspection.
  - 7. <u>Approved manufacturers for finish coats include:</u> Themec Series 1028 Enduratone or equal.
- G. System F Cement Mortar Coating of Steel Pipe
  - 1. <u>Type:</u> cement-mortar lining and coating in accordance with AWWA C205.
  - 2. <u>Service Conditions:</u> shall be used to coat exterior of buried surfaces of ferrous pipe.
  - 3. <u>Thickness:</u> Provide a 3/4-inch minimum thickness mortar coating reinforced with 3/4-inch galvanized welded wire fabric or 2 × 4 W0.5 × W0.5 welded wire fabric in accordance with AWWA C205.
  - 4. <u>Coating:</u> Coating shall be in accordance with AWWA C205 and the cement mortar shall contain no less than 1-part Type V cement to 3-parts sand. The cement mortar shall be cured by one of the following methods:
  - 5. A curing compound meeting the requirements of ASTM C 309, Type II, white pigmented, or by enclosure in an 8-mil-thick polyethylene sheet with all edges and joints lapped by at least 6 inches in accordance with AWWA C205; or

- 6. Moist Curing and Additional Water Application in accordance with AWWA C205.
- H. System G Aluminum and Galvanized Surfaces in Contact with Concrete
  - 1. <u>Type:</u> Low VOC epoxy coating. A total dry-film consisting of the combined thickness of both a prime coat and finish coat is described herein. The total dry-film thickness of this system shall be 15 mils.
  - 2. <u>Service Conditions:</u> Shall be used to coat areas including, but not limited to, gates, stairs, pipe supports, or structural members in contact with concrete.
  - 3. <u>Surface Preparation:</u> Apply synthetic resin wash primer (phosphoric acid or vinyl butyral acid) to surface. Surface preparation shall comply with SSPC SP-1.
  - 4. <u>Prime Coat:</u> Apply to a dry-film thickness of 5 mils. Approved
  - 5. <u>Finish Coats:</u> Apply two coats, each with a 5 mil dry-film thickness, to achieve the total dry-film thickness. The coating shall be the same material as the prime coat.
  - 6. <u>Manufacturers:</u> Tnemec Series L69F, or equal.

#### PART 3 EXECUTION

#### 3.01 GENERAL

- A. All painting shall be done in strict accordance with the painting manufacturer's written instructions, and these hereby become a part of these Specifications.
- B. The Contractor shall prepare all surfaces and shall be responsible for surfaces being in suitable condition to receive paint before application is made. All surfaces shall be clean. Steel surfaces shall be shop cleaned and primed with field cleaning and touch up as required. Wire brushes or abrasives shall be used where necessary. Cracks and corners shall be scraped out and wiped clean. The approval of surface preparation by the Owner shall be obtained before painting is started.
- C. Drop cloths shall be placed where required to protect floors and equipment from spatter and droppings. The canopies of lighting fixtures shall be removed and the fixtures covered and protected from injury.
- D. Electric switch plates and fixtures shall be removed before painting and replaced on completion of the work. The Contractor shall remove all paint from glass and clean and polish same. Unless otherwise specified herein and approved by the Owner, all surfaces shall receive one coat of shop/factory applied prime coats and two finish coats of paint.
- E. Paint shall not be applied in extreme heat, nor in dust or smoke laden air, nor in damp or humid weather. Work shall be free from "runs," "bridges," "shiners,", "laps," or other imperfections due to faulty workmanship. Paint materials shall be kept sealed or covered when not in use. Oily rags or waste shall be kept in covered containers and disposed of at frequent intervals. All painting shall be done in a thorough, workmanlike manner.
- F. No painting shall be done when the temperature is below 50 degrees Fahrenheit or below the temperature recommended by the coating/paint manufacturer.

TS 15-5



## PART 1 GENERAL

#### 1.01 SCOPE

A. This section covers valves and appurtenances, complete.

## 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submittals shall include the following information at a minimum. Factory signed and dated certification of compliance shall accompany all submittals. Signatures of agents or distributors of the factory will not be accepted.
  - 1. Manufacturer's catalog data and detail construction sheets showing all parts and describing materials of construction by material and specification (such as AISI, ASTM, SAE, or CDA).
  - 2. Dimensions including laying lengths.
  - 3. Dimensions and orientation of valve actuators, as installed on the valves.
  - 4. Linings and coatings.
  - 5. Factory torque sheets minimally supplying actuator output and valve input torque requirements. Method for calculating input torque shall be the same as per AWWA Class 150B designation.

#### PART 2 MATERIALS

#### 2.01 GENERAL

A. All materials and lubricants shall be NSF 61 certified for potable water applications.

#### 2.02 GATE VALVES, 2-INCHES TO 12-INCHES

- A. Gate valves shall be Resilient Seated Gate Valves conforming to AWWA C509 or AWWA C515. Valves shall be rated for a minimum working pressure of 150 psi and shall have end fittings to conform to the pipe or fittings being connected. Valves shall be provided with operating nuts when installed underground, and handwheels when installed aboveground.
- B. Valves shall be American Flow Control "Series 2500", Mueller "2360 Series", Clow "Model 2639/2640", or approved equal.

# 2.03 VALVE BOXES, PIPE EXTENSION, AND EXTENSION STEMS

A. Valve boxes shall be provided for all gate valves placed underground and shall be similar and equal to Brooks Products, Inc., No. 3-RT or Christy G5, with 8-inch SDR 35 PVC pipe extension sleeve; cover to be marked "Water."

B. Extension stems shall be solid 1-1/4-inch round or square Type 316 stainless steel bar with a circular centering guide and shall be complete with 2-inch square operating nut. No pinned couplings are permitted.

#### 2.04 SERVICE SADDLE

- A. All taps for 2-inch and smaller service connections shall be made with service saddles. Connections for pipes larger than 2-inch shall be made with appropriate fittings installed in the main. Service saddles shall be one size larger than service line and shall be fitted with insulating nylon bushings.
- B. Service saddles shall be of a type recommended by the manufacturer for the type of pipe being tapped. Saddle shall be the full-body support type. Hardware shall be Type 304 SS.
  - 1. PVC Pipe Service Saddle
    - a. Romac Series 101S or approved equal.
    - b. Romac Series 101NS or approved equal if located in corrosive soils per the Engineer.
  - 2. Other Pipe Materials
    - a. Smith-Blair series SB 317 or approved equal.

#### 2.05 CORPORATION STOP

A. Corporation stops shall be brass ball-type male x male with AWWA I.P. thread inlet and M.I.P. thread outlet, full size diameter inlet to outlet. Corporation stops shall be Mueller B-20013N, Mueller B-2969N, or an approved equal.

#### 2.06 CURB STOP

A. Curb stops shall be a brass ball-type female x female with F.I.P. inlet and outlet. Curb stops shall be Mueller B-20200 or approved equal.

#### 2.07 METER BOX

- A. Meter boxes and extensions shall be reinforced concrete.
- B. Boxes located in sidewalks or landscaped areas (areas where no vehicular traffic is expected) shall be Christy Box B16 with B16G lid for 1-inch service, B36 with B36G lid for 2-inch service, or approved equals.
- C. Boxes located in driveways or other traffic areas shall be traffic rated Christy Box B1324 with traffic rated steel checker plate with reader door and bolt down locking for 1-inch service, B1730 with traffic rated steel checker plate with reader door and bolt down locking for 2-inch service, or approved equals.
- D. Cover to be marked "Water."
- E. Meter boxes and extensions shall be manufactured by Christy Concrete Products or approved equal.

#### 2.08 TRACER WIRE

A. Tracer wire shall be in accordance with Technical Specification titled "Facility Identification."

#### 2.09 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

## 2.10 FLANGE INSULATION KITS

A. Flange insulation kits shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 2.11 BOLTS, NUTS, AND WASHERS FOR FLANGES

A. Flange hardware shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 2.12 GASKETS

A. Gaskets for flanged joints shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 2.13 COATING AND LINING

A. Valves and service saddles shall be fusion-bonded epoxy lined and coated in accordance with Technical Specification titled "Protective Coatings", System D.

#### 2.14 EXPANSION COUPLING

- A. Expansion couplings shall be installed as shown. Flanges shall conform to AWWA C207. All bolting hardware shall be stainless steel 316L. All internal surfaces (wetted parts) shall be lined with a minimum of 15 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C213 and shall be ANSI/NSF-61 compliant. Exterior surfaces shall be coated with a minimum of 6 mils of fusion bonded epoxy conforming to the applicable requirements of ANSI/AWWA C116/A21.16.
- B. Expansion coupling shall be Force Balanced Ex-tend as manufactured by EBAA Iron, Inc. or approved equal.

#### 2.15 COMBINATION AIR VALVE

- A. Combination air valves shall comply with AWWA C512 and shall be designed for an operating pressure of 20-150 psi. Unless otherwise shown or specified, the air valve shall be 1-inch NPT screwed and shall have a cast iron body and top, ASTM A240 stainless steel float and trim with a BUNA-N seat.
- B. Combination air valve shall be single body APCO 140C series or approved equal.
- C. Gate valve for combination air valve assembly shall be Stockham 1" bronze gate valve, class 150 or approved equal.

TS 16-3

D. County Road 19 Bridge Crossing combination air valve vents to be located in a valve vent enclosure as shown in the drawings. Valve vent enclosure shall be VCAS-1424 Polyethylene Valve Vent of color indicated by the City and as manufactured by Pipeline Products, Inc.

## PART 3 EXECUTION

#### 3.01 GENERAL

- A. Installation practices shall conform to manufacturer's recommendations and as shown on the Drawings.
- B. Before installation, carefully clean valves of all foreign material, and inspect valves in open and closed positions. Install valves in accordance with the applicable portions of these Specifications. Unless otherwise indicated, install valves with the stem vertical. Mount horizontal valves so that adequate clearance is provided for operation.
- C. Prior to installing flanged valves, the flange faces shall be thoroughly cleaned. After cleaning, insert the gasket and tighten the nuts progressively and uniformly. If flanges leak under pressure, loosen the nuts, reseat or replace the gasket, re tighten the nuts, and retest the joint.
- D. Thoroughly clean threads of screwed joints by wire brushing, swabbing, or other approved method. Apply approved joint compound to threads prior to making joint. Joints shall be watertight at test pressures before acceptance.
- E. Valves shall be pressure tested at the same time that the connecting pipelines are pressure tested. See Technical Specification titled "Water Pipe and Fittings", for pressure testing requirements.

#### 3.02 VALVE BOXES, PIPE EXTENSIONS, AND EXTENSION STEMS

- A. Installation of valve boxes, pipe extensions, and extension stems shall conform to Detail 3, Valve Cover Installation as shown on DWG. No. CG-03.
- B. Valve boxes shall be firmly supported and shall be kept centered and plumb over the operating nut of the valve.
- C. Beveled sections of pipe shall not be allowed at the top of the valve riser pipe. The top cut shall be square and machine made.

#### 3.03 TRACER WIRE

A. Tracer wire for valves and water services shall installed be in accordance with Technical Specification titled "Facility Identification."

#### 3.04 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement for buried valves and couplings shall be installed in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 3.05 FLANGE INSULATION KITS

A. Flange insulation kits for buried and above grade pipe shall be installed in accordance with Technical Specification titled "Water Pipe and Fittings."

TS 16-4

#### 3.06 BOLTS, NUTS, AND WASHERS FOR FLANGES

A. Hardware shall be installed in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 3.07 GASKETS

A. Gaskets for flanged joints shall be installed in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 3.08 SERVICE SADDLES

A. Service saddles shall be installed and tested in accordance with the manufacturer's recommendations and at the locations shown in combination with input from City of Orland Representative.

#### 3.09 TESTING

- A. Valves shall be tested for leakage at the same time that the connecting pipelines are hydrostatically tested. See Technical Specification titled "Water Pipe and Fittings" for pressure testing requirements. Joints shall show no visible leakage under test. Repair joints that show signs of leakage prior to final acceptance.
- B. Meter services shall not be hydrostatically pressure tested during the testing of pipeline in accordance with Technical Specification titled "Water Pipe and Fittings."
  - 1. Water services shall be tested up to the curb stop only.

#### 3.10 METER BOX

A. Meter box shall be installed in accordance with Technical Specification titled "Meters."

#### 3.11 EXPANSION COUPLING

A. Expansion coupling shall be installed per manufacturer's installation instructions.

#### 3.12 COMBINATION AIR VALVE

A. Combination air valve shall be installed per manufacturer's installation instructions.



TS 16-6

## PART 1 GENERAL

#### 1.01 SCOPE

A. This section covers potable water pipe, fittings, and appurtenances, complete.

#### 1.02 SUBMITTALS

A. Submittals shall be furnished in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.

#### B. Steel Pipe

- 1. Prior to fabrication of any pipe materials specified under this section of the Specifications, the Contractor shall submit line layout drawings and detailed shop drawings. Include lay lengths of fittings, valves, meters, couplings, harnesses, and other equipment which determine piping dimensions. Label or number each fitting or piece of pipe and provide the following information for each item:
  - a. Materials of construction, including references to industry standards being met (i.e. ASTM, ANSI, AWWA, and other related standards).
  - b. Shop inspection and testing requirements.
  - c. Inside diameter, steel wall thickness, internal design pressure (lining and coating thicknesses) for each class of pipe to be furnished.
  - d. Electrode manufacturer's data and product data, including electrodes to be used for dissimilar metals.
  - e. Indicate all shop and erection details including cuts, copes, connections, holes, threaded fasteners and welds. Indicate welds using AWS "Welding Symbols
  - f. Order of installation and closure locations for length adjustment and for construction convenience.
  - g. Pipe invert station and elevation of each change of grade and alignment.
  - h. Elements of curves and bends, both in horizontal and vertical alignment, including elements of the resultant true angular deflections in cases of combined curvature.
  - i. Shop applied and field applied coating systems (primer and top coats), coating materials. Shop drawings shall detail type and thickness where joints and other coating and lining holdbacks occur.
  - j. Call out types and sizes, and dimensions of grooved-end collars, flanges, reinforcing collars, wrapper plates, and crotch plates.
  - k. Limits of each reach of field-welded joints and of concrete encasement.
  - I. Locations of manholes, hand holes, and other points of access.

- m. Location of valves and other mechanical equipment.
- n. Locations of bulkheads for field hydrostatic testing of pipeline.
- 2. All shop drawings of pipe fittings, specials, and ends shall be reviewed and stamped by the pipe manufacturer before submittal to the Owner.
- 3. Show all pertinent details for field installation and shop fabrication of pipe, pipe fittings and specials for piping, including joint details for approval by the Owner.
- 4. Pipe, pipe fittings and specials and joints shall be fabricated in accordance with the approved shop drawings, no deviations will be allowed.
- 5. Mill test reports on each heat from which steel is rolled.
- 6. Welding
  - a. Welder performance qualification test records "welders' certification"
  - b. Written Welding Procedure Specifications (WPSs) in accordance with AWS D1.1 requirement for each different welded joint proposed for use whether prequalified or qualified by testing
  - c. Welding Procedure Qualification Records (WPQR) test results
  - d. Welding repair procedures
  - e. Certified Material and Test Reports
  - f. Schedule detailing inspections, NDT test dates and inspection hold points.
  - g. Inspection and Testing (physical and chemical properties of all steel, hydrostatic test reports, weld test reports, etc.).
- C. Ductile Iron and PVC Pipe
  - 1. Affidavits of compliance with standards referenced in this specification (AWWA C151, AWWA C900, etc.) shall be provided.
  - 2. Submit materials list and manufacturer's specification sheets showing material of pipe, fittings, joint restraint, and appurtenances with ASTM reference and grade.
  - 3. Submit lining, coating, and thicknesses.
  - 4. Joint details for all types of joints used shall be submitted.
  - 5. If required by the Owner, calculations and/or test data proving that each proposed restrained joint arrangement can transmit the required forces shall be submitted.

#### D. Galvanized Steel Pipe

- 1. Submit materials list showing material of pipe and fittings with ASTM reference and grade.
- 2. Submit lining, coating, and thicknesses.
- E. Copper Pipe
  - 1. Submit materials list and manufacturer's specification sheets showing material of pipe, fittings, proposed method of joint restraint, and appurtenances with ASTM reference and grade.
  - Submit catalogue order sheets for materials of pipe, fittings, solder, and appurtenances, showing metal composition and conformance to industry standards (ASTM, etc.) specified. The material data sheets shall indicate NSF certification for materials used on the potable water system.

- F. Polyethylene Pipe
  - 1. Affidavits of compliance with standards referenced in this specification (AWWA C901, etc.) shall be provided.
  - 2. Submit materials list and manufacturer's specification sheets showing material of pipe, fittings, and appurtenances with ASTM reference and grade.
- G. Couplings
  - 1. Submit manufacturer's catalog data and detail construction sheets showing all parts, dimensions, linings and coatings, and describing materials of construction by material and specification (such as AISI, ASTM, SAE, or CDA).
- H. Submit manufacturer's catalog data, detail construction sheets, materials of construction by material and specification for gaskets, insulation kits, hardware, and polyethylene encasement.
- I. Connections to existing systems
  - 1. Submit existing system connection details and materials
  - 2. Submit proposed existing system connection and materials/equipment inspection dates.
- J. Submit a comprehensive hydrostatic testing plan and a test report for each section. Include test bulkhead locations and design calculations, pipe attachment details, and methods to prevent excessive pipe wall stresses.
- K. Submit a comprehensive flushing and disinfection plan.

# 1.03 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen trained and experienced in necessary trades and crafts and completely familiar with specified requirements and methods for proper performance of Work of this section.
- B. Materials used in the manufacture of the pipe shall be tested in accordance with the requirements of this Section and the referenced standards, as applicable.
- C. The Contractor shall perform said material tests. The Engineer shall have the right to witness testing, provided that the Contractor's schedule is not delayed for convenience of the Engineer.
- D. In addition to those tests specifically required, the Engineer may request additional samples of any material for testing by the City. The additional samples shall be furnished as part of the Work.
- E. The City of Orland Representative will be responsible for field welding inspection (visual), as noted elsewhere in this section. The Contractor is responsible for scheduling inspection with the Engineer at least 72-hours prior all field welding work.

#### 1.04 WELD INSPECTION AND TESTING

- A. If required, the City will provide Special Inspection, defined by California Building Code (CBC) Section 1704, for welding.
- B. Visual welding inspection and Non-Destructive Testing (NDT) shall be conducted in accordance with a written practice by personnel qualified in accordance with AWWA C206.

## C. Weld Tests

- 1. Visual Inspection
  - a. Continuous visual inspection.
  - b. Check fit-up of joint materials. Verify satisfactory alignment of material. Verify gaps and bevels of penetration welds.
  - c. Check during welding. Verify satisfactory technique is used.
  - d. Check after welding completed and cleaned by wire brush or chipping hammer.
  - e. Inspect with magnification when necessary and under strong, adequate light.
  - f. Inspect for the following defects:
    - 1) Surface cracking.
    - 2) Porosity.
    - 3) Excessive roughness.
    - 4) Unfilled craters.
    - 5) Gas pockets.
    - 6) Undercuts.
    - 7) Overlaps.
    - 8) Size.
    - 9) Insufficient throat and concavity.
- 2. Nondestructive Testing
  - a. Ultrasonic testing, except where not feasible, as determined by the Owner, due to the type or location of the weld. Magnetic particle, liquid penetrant or radiograph tests when ultrasonic testing is not feasible as determined by the Owner.
    - 1) Ultrasonic inspection technique and standards: AWS D1.1 Part C.
    - 2) Particle inspection method: ASTM E 709.
    - 3) Penetrant inspection method: ASTM E 165.
    - 4) Radiography tests: AWS D1.1, Part B.
    - 5) Nondestructive testing technicians and operators shall be NDT Level II as defined in American Society for Nondestructive Testing, Inc., Recommended Practice No. SNT-TC-1A. The Level II technician shall sign the test reports.
- 3. Shop Inspection and Testing
  - a. Visual inspection of all welds.
  - b. Measurement of weld profiles for 25 percent of all welds at random.

- c. NDT for all welds.
- 4. Field Inspection
  - a. Visual inspection of all welds.
  - b. Measurement of all weld profiles [for 25 percent of all welds at random].
  - c. NDT for a 25 percent of all field welds.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Pipe, fittings, specials, couplings, joint restraints, and appurtenances shall at all times be handled and stored in a manner that will ensure installation in sound, undamaged condition.
- B. <u>Onsite Storage Limitation</u>: Onsite pipe storage shall be limited to a maximum of one week unless exception is approved by the Owner.
- C. Care shall be taken to avoid cracking of the cement mortar coating and/or lining on steel or ductile iron pipe and fittings. If necessary, plastic sheet caps shall be used to close pipe ends and keep coatings and linings moist.

## PART 2 MATERIALS

#### 2.01 GENERAL

A. All materials and lubricants shall be NSF 61 certified for potable water applications.

#### 2.02 STEEL PIPE AND FITTINGS

- A. Steel Pipe
  - 1. Steel pipe shall be mill-type steel pipe in accordance with AWWA C200 rated for a working pressure of 150 psi, but the steel cylinder thickness shall be a minimum 1/4-inch. Steel shall be ASTM A 36, ASTM A 1011 or A 1018, Grade 36, having a 0.25% maximum carbon content.

#### B. Fittings

- 1. <u>Definition:</u> A fitting shall be defined as a piece of pipe other than a straight full-length joint. Elbows, manhole sections, reducers, and sections of pipe with outlets shall be considered fittings. Dimensions shall be per AWWA C208.
- 2. <u>Pressure Rating:</u> Fittings 4- through 10-inches in diameter shall be designed for 250 psi and conform to ANSI B16.9. Fittings 12-inches in diameter and larger shall comply with AWWA C208.
- 3. <u>Fittings:</u> Fittings shall be flanged, butt-welded, or grooved as shown. Material for fittings 4- through 10-inches shall comply with ASTM A 234, Grade WPB. Material for fittings larger than 10-inches but less than or equal to 30-inches in diameter shall be the same as the pipe. Wall thickness (except for grooved ends) shall be the same as the adjoining pipe. Grooved-end joints shall comply with AWWA C606. Cement-mortar lining and I.D. dimensions shall be the same as the specified pipe. Smooth long radius forged steel fittings are required in-lieu of fabricated steel fittings.

TS 17-5

- 4. <u>Design:</u> Collars, wrapper plates, crotch plates, and other fittings shall be designed in accordance with AWWA M11.
- C. Length of Pipe Sections
  - 1. Pipe sections shall be limited to 40 feet or less. For sections longer than 30 feet, spreader beams, and lifting straps shall be used to lift pipe sections at the third points.
- D. Joints
  - 1. <u>Above Ground Joints:</u> Joints above ground or in vaults and structures shall be flanged or grooved end, unless specifically indicated otherwise on the project plans.
  - 2. Buried Joints
    - a. Bell-and-spigot lap welded unless specifically indicated otherwise on the project plans.
    - b. Butt-strap joints. Closure pieces may also require butt-strap joints with "handholes" and threaded-steel plugs welded into place (for proper repair of the lining of the interior pipe joints.).
  - 3. <u>Grooved-End Joints:</u> Grooved-end joints shall be flexible, square-cut grooved, per AWWA C606, Table 5.
- E. Coating and Lining
  - 1. Pipe and fittings installed underground shall be cement mortar lined and coated in accordance with AWWA C205 and with Technical Specification titled "Protective Coatings", System F.
  - 2. Pipe and fittings installed above ground shall be cement mortar lined per AWWA C205 and epoxy fusion-bonded epoxy coated in accordance with Technical Specification titled "Protective Coatings", System C.
  - 3. <u>Cement:</u> Cement for cement-mortar lining shall be ASTM C150, Type II or V. Cement for cement-mortar coating shall be ASTM C150, Type V.
- F. Flanges shall be AWWA C207, Class D, flat face.
- G. Outlets
  - 1. <u>Outlets 2-inches in Diameter and Smaller:</u> Outlets of sizes 2-inches in diameter and smaller shall be of the "Thread-o-let" type, per AWWA Manual M-11. Outlets shall be 3,000 pound WOG forged steel per ASTM A105 or ASTM A216, Grade WCB. Threads shall comply with ASNI B2.1. Outlets shall be Bonney Forge Co. "Thread-o-let", Allied Piping Products Co. "Branch-let", or approved equal.
  - 2. <u>Outlets Larger than 2-inches in Diameter:</u> For outlets larger than 2-inches in diameter, flanged tees shall be used.

TS 17-6

- H. Grooved-end couplings
  - 1. Grooved-end couplings shall be ductile iron, ASTM A536, Grade 65-45-12 or greater. Gaskets shall be EPDM and shall conform to ASTM D2000. Couplings shall be flexible type, square cut groove, per AWWA C606. Couplings for steel pipe 24-inches in diameter and smaller shall be flexible type, square cut groove, per AWWA C606, and shall be Victaulic Style 77.

## 2.03 DUCTILE IRON PIPE AND FITTINGS

- A. Ductile iron pipe shall be Class 50 ductile iron pipe conforming to AWWA Specification C151. Pipe shall have bell and spigot, mechanical, or flanged joints. Pipe shall be cement-mortar lined and bituminous coated in accordance with AWWA C104 and AWWA C151, respectively.
- B. Ductile iron fittings shall comply with AWWA Specification C110 and shall be cement-mortar lined per AWWA C104 (double thickness) and bituminous coated per AWWA C110 as specified for the pipe. Fittings shall be supplied with bell and spigot ends, mechanical joints, or flanges compatible with the adjoining pipe. Gray-iron fittings shall not be used in lieu of ductile-iron. Compact fittings per AWWA C153 are not allowed.
- C. Ductile-iron pipe and fittings shall be as manufactured by American Cast Iron Pipe Company; Atlantic States Cast Iron Pipe Company; Clow Water Systems Company; Griffin Pipe Products Company; McWane Cast Iron Pipe Company; Pacific States Cast Iron Pipe Company; U.S. Pipe and Foundry Company; or equal.

# 2.04 POLYVINYL CHLORIDE (PVC) PIPE AND FITTINGS

- A. PVC pipe 3-inches and smaller shall be SR (Schedule Rated) in accordance with ASTM D1785 for Schedule 80 pipe and suitable for solvent weld joints. Fittings shall be Schedule 80 socket fittings conforming to ASTM D2467.
- B. PVC Pipe 4-inches and larger shall comply with AWWA C900. Unless otherwise shown, the dimension ratio (DR) for 4 inch through 12 inch shall be DR 18 or thicker walled (lower DR). Fittings shall be ductile-iron conforming to the requirements specified herein with the same pressure rating and hydrostatic test pressure as the adjoining pipe.
- C. C900 PVC pipe shall be as manufactured by Diamond Plastics Corporation, JM Eagle, NAPCO, or approved equal.

# 2.05 GALVANIZED STEEL PIPE AND FITTINGS, 3-INCHES IN DIAMETER AND LESS

- A. Galvanized steel pipe shall be, hot-dip galvanized, standard weight (Schedule 40) conforming to ASTM A53.
- B. Fittings shall be threaded forged steel fittings conforming to ASTM A105, ASME B1.20.1, and ASME B16.11 and galvanized conforming to ASTM B633.

#### 2.06 RESTRAINED JOINTS FOR C900 PVC PIPE

A. Where restrained joints are required (specified or shown on the Drawings), the system shall be suitable for mechanical joint fittings, bell and spigot joints, or flanged fittings as needed. The teebolts, threaded rods, and associated hardware shall be 316 stainless steel. Restraints shall be fusion-bonded epoxy lined and coated in accordance with Technical Specification titled "Protective Coatings", System D.

- 1. Mechanical joint restraint system shall be one of the following or equal:
  - a. EBAA Iron Series 2000PV MEGALUG.
  - b. Star Pipe PVC Stargrip Series 4000.
- 2. Bell and spigot restraint system shall be one of the following or equal:
  - a. EBAA Iron Series 2800.
  - b. Star Pipe PVC Stargrip Series 4400.
- 3. Flanged joint to plain end pipe restraint system shall be one of the following or equal
  - a. <u>Steel Flange:</u> Baker Series 602
  - b. <u>Ductile Iron Flange:</u> ROMAC Style RFCA-PVC

## 2.07 COPPER PIPE

- A. Copper pipe and tubing shall conform to ASTM B88. Copper pipe and tubing shall be cylindrical, of uniform wall thickness, and shall be free from any cracks, seams, or other defects. Piping buried or located beneath floor slabs shall be Type K.
- B. Copper fittings shall be copper conforming to ASTM B75 and ANSI B16.22, with solder end joints. Copper fittings 3/8-inch and smaller may have flared end connections or compression joint connections. Solder shall be tin-silver solder conforming to ASTM B32, Grade Sn94, Sn95 or Sn96. Cored solder shall not be used. Solder and flux used in joints of potable waterlines shall contain no more than 0.2 percent lead.
- C. Copper pipe shall be as manufactured by Cambridge-Lee Industries, Inc., Cerro Copper Products Company, Halstead Industries, Inc., IUSA/Reading, Mueller Manufacturing Entities c/o Mueller Industries, Inc., or approved equal.

# 2.08 POLYETHYLENE PIPE

- A. Pipe
  - 1. Polyethylene pipe shall be PE 4710, SDR9, with blue color-coded stripe conforming to AWWA C901 and ANSI/NSF Standard 61. For potable water applications, PE4710 compound shall conform to ASTM D3350 minimum Cell classification PE445574C-CC3.
  - 2. <u>Color identification by the use of stripes:</u> equally spaced, blue color stripes co-extruded into the pipe outside surface. Stripes printed on the pipe outside surface are not acceptable.
  - 3. <u>Polyethylene piping is allowed for water services.</u> Water service piping from water main to meter shall be one continuous length and shall not have any joints.
- B. Polyethylene pipe shall be as manufactured by Performance Pipe (a division of Chevron Philips Chemical Company), JM Eagle, or approved equal.

TS 17-8

#### 2.09 FLEXIBLE COUPLINGS

A. Flexible couplings shall be as manufactured by Rockwell, Baker, Romac or approved equal. All mechanical couplings shall have the longest standard sleeve length and shall be provided with thrust anchors. Coupling material shall match the connecting valve, fitting, or pipe material. Couplings shall have Type 316 stainless steel hardware and be fusion-bonded epoxy lined and coated in accordance with Technical Specification titled "Protective Coatings", System D.

## 2.10 CONCRETE

A. Concrete for thrust blocks shall be Class C concrete and shall conform to Technical Specification section titled "Concrete Work."

#### 2.11 POLYETHYLENE ENCASEMENT

A. Unless specified otherwise, all buried ferrous pipe, fittings (all material types), couplings, flanges, and valves shall be polyethylene encased in accordance with ANSI/AWWA C105. Polyethylene wrap shall be loose 8-mil thick LLD or 4-mil thick HDCL polyethylene tube. Polyethylene adhesive tape shall be two inch-wide and 10-mil thick, Polyken 900, Scotchwrap 50, or approved equal.

## 2.12 TRACER WIRE

A. Tracer wire material shall be in accordance with Technical Specification titled "Facility Identification."

## 2.13 FLANGE INSULATION KIT

- A. Material shall be designated by the manufacturer as suitable for the operating temperature and pressure of the service. Flange insulation kits shall consist of the following items:
  - 1. Insulating Gaskets
    - a. Gaskets shall be Type E full-faced, 1/8-inch minimum thickness, dielectric neoprene faced phenolic. Gaskets shall be Advance Products & Systems, Inc.; George Fischer Central Plastics; Pipeline Seal & Insulator, Inc; or equal.
  - 2. Insulating Sleeves and Washers
    - a. Insulating stud sleeves and washers shall be one-piece and full-length, made of Minlon or Mylar. One 1/8-inch thick gasket shall be attached to the sleeve, while the other shall be loose. Single insulating washers and sleeves shall be used on buried insulating flanges.
  - 3. Insulating Washers for Bolts
    - a. Insulating washers shall be 1/8-inch thick glassclad phenolic. Single insulating washers shall be used on buried insulating flanges. Double insulating washers and full length sleeves shall be used on insulating flanges above ground, in structures, or in vaults.
  - 4. Steel Washers Over Insulating Washer
    - a. Steel backing washers shall be 1/8-inch thick Type 316 stainless steel.
  - 5. Compatibility with Valves
    - a. Insulating flange kits are not compatible with most valve flanges. Where cathodic isolation is required near a valve, a flanged spool shall be installed adjacent to

the valve, and the required insulating joint shall be installed at the opposite end of the spool from the valve. Flanged spool material shall match valve material.

- 6. Manufacturers
  - a. Flange insulation kits shall be as manufactured by Advance Products & Systems, Inc.; George Fischer Central Plastics; Pipe Seal & Insulators; or equal.

# 2.14 BOLTS, NUTS, AND WASHERS FOR FLANGES

- A. Bolts, nuts, and washers for flanges shall be Type 316 stainless steel conforming to ASTM A 193, Grade B8M, for bolts and ASTM A 194, Grade 8M, for nuts.
- B. For grooved-end fittings, bolts shall be Type 316 stainless steel and conform to ASTM F 593 or ASTM A 183 and have a minimum tensile strength of 100,000 psi.
- C. Washers shall be provided for each nut, shall be of the same material as the nut, and shall be installed adjacent to the nut, between the nut and the flange.
- D. The length of each bolt shall be such that between 1/4-inch and 1/2-inch will project through the nut when drawn tight. Studs may be used instead of bolts only where approved by the Engineer.

# 2.15 GASKETS

- A. <u>Gaskets for Flanged Joints:</u> Gaskets for flanged joints shall be 1/8-inch thick and be made of EPDM, or synthetic fiber. Gaskets shall be suitable for a water pressure of 350 psi at a minimum temperature of 180°F. Gaskets shall be NSF 61 certified for potable water applications. Full face type gaskets with pre-punched holes shall be used where both flanges are flat face. Ring gaskets extending to the inner edge of the bolts may be used where a raised face flange is present.
- B. <u>Gaskets for Push-on, Mechanical, and Restrained Joints:</u> Gaskets for push-on, mechanical, and restrained joints shall be synthetic or natural rubber in accordance with AWWA C111.
- C. <u>Manufacturers:</u> Gaskets shall be Garlock 3760-U and 98206, Teadit Style 1082 SAN, and U.S. Pipe Flange-Tyte, or equal.

# 2.16 THREAD LUBRICANT

A. Thread lubricant for threaded joints shall be Teflon thread lubricating compound or Teflon tape.

# PART 3 EXECUTION

#### 3.01 GENERAL

- A. All materials shall be handled in a manner that will not damage the material or its coating. Before installation, each article shall be inspected and any damaged material shall be discarded. Any damaged coating shall be repaired. The interior and ends of the pipe and appurtenances shall be clean. When it is necessary to cut pipe, such cuts shall be neatly made with equipment recommended by the pipe manufacturer.
- B. Water lines shall be installed at least ten (10) feet, measured horizontally, from existing or proposed sewer lines unless shown otherwise.

- C. Galvanized iron pipe may only be used where specifically shown on the Drawings and as approved by the Owner.
- D. Pipe shall be installed in accordance with the manufacturer's instructions, Technical Specification titled "Trench Excavation and Backfill", and the AWWA and ASTM standards listed below by pipe material:
  - 1. Steel pipe and fittings shall be installed in accordance with AWWA C604.
  - 2. Ductile iron pipe and fittings shall be installed in accordance with AWWA C600.
  - 3. PVC (C900) pipe shall be installed in accordance with AWWA C605.
  - 4. Copper pipe and fittings shall be installed as specified herein.
  - 5. Polyethylene (AWWA C901) pipe and fittings shall be installed in accordance with AWWA Manual M55 (Chapter 8).

## 3.02 CONNECTIONS TO EXISTING SYSTEMS

- A. Contractor shall field verify existing pipeline location (horizontal and vertical), depth and material, size, roundness, and connection type prior to construction and submit data to the Owner for review.
- B. Contractor shall coordinate with the Engineer and City to schedule a shutdown for each system connection. For bidding purposes, assume that advanced notice of fourteen (14) calendar days is required and that the shutdown duration will be limited to no more than forty-eight (48) hours. The Contractor is also required to notify City and residents and businesses located within the affected shutdown area with an advanced notice of fourteen (14) calendar days. Upon the Engineer's approval, the Contractor may be allowed to work extended hours during the shutdown period.
- C. All approved materials and tools and equipment required to complete the tie-in work shall be onsite a minimum of three (3) days prior to the City approved shutdown date. The Engineer will verify that the required items are onsite. Contractor shall provide three (3) days advance notice and coordinate with the Engineer for materials inspection. A failed inspection shall result in the restart of the shutdown process and notification.
- D. The City will be responsible for isolating and dewatering the existing pipelines prior to the approved system shutdown date. Note that the pipelines will not be completely dewatered, and the Contractor shall expect nuisance water. This water shall not enter the excavation or trench. Disposal of the nuisance water shall be in accordance with all applicable state, federal, and local laws. The Contractor's dewatering activities shall take place outside of the approved shutdown period.
- E. Connections and new pipe shall be pressure tested and disinfected as specified herein.

#### 3.03 HANDLING OF PIPE

A. <u>Moving Pipe:</u> Pipes shall be lifted with handling beams or wide belt slings as recommended by the pipe manufacturer. Cable slings shall not be used. Pipe shall be handled in a manner to avoid damage to the pipe. Pipe shall not be dropped or dumped from trucks or into trenches under any circumstances.

- B. <u>Internal Pipe Braces:</u> Internal braces placed in steel pipes shall be maintained until backfilling and compaction are completed.
- C. <u>Pipe Caps:</u> Plastic caps placed over the ends of steel pipe shall not be removed until the pipe is ready to be placed in the trench. Plastic caps may be opened temporarily to spray water inside the pipe for moisture control.
- D. <u>Inspection of Pipe:</u> The pipe and accessories shall be inspected for defects prior to lowering into the trench. Any defective, damaged or unsound pipe shall be repaired or replaced. All foreign matter or dirt shall be removed from the interior of the pipe before lowering into position in the trench.

## 3.04 PLACEMENT OF PIPE IN TRENCH

- A. <u>General:</u> Dewatering, excavation, shoring, sheeting, bracing, backfilling material placement, material compaction, compaction testing, and pipe laying requirements and limitations shall be in accordance with Technical Specification titled "Trench Excavation and Backfill."
- B. <u>Sanitation of Pipe Interior</u>: During laying operations, tools, clothing, or other materials shall not be placed in the pipe.
- C. <u>Prevention of Entry into Pipe:</u> When pipe laying is not in progress, including lunch-hour, the ends of the pipe shall be closed using plugs constructed in a manner to prevent entry by any debris, animal or vermin.
- D. <u>Laying Pipe on Grades over 5 Percent:</u> Pipes shall be laid uphill with the bell or collared joints on the uphill end of each pipe length, whenever the grade exceeds five percent.
- E. <u>Pipe Base Thickness:</u> Pipe base thickness shall be as specified in Technical Specification titled "Trench Excavation and Backfill."
- F. <u>Depressions at Joints and Pipe Sling Points:</u> Depressions shall be dug into pipe base material to accommodate the pipe bell and external joint filler form ("diapers"), and to permit removal of the pipe handling slings.
- G. <u>Placement of Pipe on Pipe Base</u>: Pipe shall be lowered onto the bedding and installed to line and grade its full length on firm bearing except at the bell and at sling depressions.
- H. <u>Acceptable Line and Grade for Piping:</u> The pipe shall be laid true to the line and grade shown on the plans within acceptable tolerances. Unless otherwise shown or specified, the tolerance on grade is 1-inch and the tolerance on alignment or line is 2-inches. Grade shall be measured along the pipe invert.
- I. <u>Pipe Installation</u>: Pipe shall be installed without springing, forcing, or stressing the pipe or any adjacent connecting valves or equipment. Precautions shall be taken to prevent pipe from being displaced by water entering trench. Damaged or displaced pipe shall be replaced or returned to specified condition and grade. As soon as possible after the installation of the pipe, sufficient backfill material shall be placed on the pipe to protect it from temperature changes.
- J. <u>Trench Curvature and Pipe Deflection</u>: The radius of curvature of the trench shall be determined by the maximum length of pipe section that can be used without exceeding the allowable deflection at each pipe joint and without causing deviation from the trench width requirements as shown. The deflection at any flexible joint shall not exceed that prescribed by the manufacturer of the pipe.

- K. <u>Equipment for Installation of Pipe:</u> Proper implements, tools, and facilities as recommended by the pipe manufacturer's standard printed installation instructions shall be provided and used by the Contractor for safe and efficient execution of the work. All pipe, fittings, valves, and accessories shall be carefully lowered into the trench using suitable equipment in such a manner as to prevent damage to pipe and fittings. Under no circumstances shall pipe or accessories be dropped or dumped into the trench.
- L. <u>Cutting and Machining Pipe:</u> Cutting and machining of the pipe shall be accomplished in accordance with the pipe manufacturer's standard procedures for this operation. Pipe shall not be cut with a cold chisel, standard iron pipe cutter, nor any other method that may fracture the pipe or produce ragged, uneven edges.

## 3.05 ASSEMBLING RUBBER-GASKETED JOINTS

- A. <u>Cleaning Ends of Pipe:</u> The ends of the pipe to be joined shall be cleaned of foreign material.
- B. <u>Lubrication</u>: After placing pipe in trench, a nontoxic water soluble vegetable soap solution shall be applied to the inside of the bell of the pipe in the trench and to the rubber gasket and spigot of the pipe to be installed. The rubber gasket shall be stretched into the groove in the bell-end of the pipe and distributed uniformly around the circumference.
- C. <u>Joint Assembly:</u> Without tilting the pipe to be installed, the spigot shall be inserted into the bell of the pipe. Come-a-longs or pipe jacks shall be used to drive spigot end into the bell until properly seated. The joint recess recommended by pipe manufacturer for made-up joints shall be maintained. Where deflections at joints are required for curved alignment, the manufacturer's recommended allowable joint opening on one side shall not be exceeded. This also applies to restrained joints. A feeler gauge shall be used to verify proper placement of each gasket.

#### 3.06 FITTINGS

- A. Fittings shall be installed utilizing standard installation procedure. Fittings shall be lowered into the trench by means of rope, cable, chain, or other acceptable means without damage to the fittings. Cable, rope, or other devices used for lowering fitting into trench, shall be attached around exterior of the fitting for handling. Under no circumstances shall the cable, rope, or other device be attached through the fitting's interior for handling.
- B. Joints of bell and spigot fittings shall be made up and sealed as specified for pipe joints.
- C. Joints of flanged fittings shall be made up true and square so that there is no strain on the pipe or fitting. Bolts shall be tightened uniformly around the joint. Fittings shall be carefully connected to the pipe and the joint shall be checked to insure a sound and proper joint.
- D. Fittings shall be wrapped with eight (8) mil. sheet polyethylene film as specified herein.

#### 3.07 MECHANICAL JOINT CONNECTIONS WITH RETAINER GLAND RESTRAINTS

A. Mechanical joint connections with retainer glands shall be assembled in accordance with the manufacturer's recommendations for the specific fitting and retainer gland. Torquing of break-off gland bolts shall be done in the presence of the City of Orland Representative. Each fitting shall be observed by the Engineer's Representative prior to bagging and backfill. Any such fittings not observed by the Engineer's Representative shall be excavated and exposed for detailed re-inspection of the fitting and bolt torque at no additional cost to the City.

## 3.08 FLANGED CONNECTIONS

- A. Bolt Hole Alignments
  - Pipe shall be set with flange bolts straddling the pipe horizontal and vertical centerlines. Use torque-limiting wrenches to provide uniform bearing and proper bolt tightness. Tighten flange bolts progressively, drawing up bolts on opposite sides gradually until bolts have uniform tightness around the flange.
- B. Nuts, Bolts, and Washers
  - 1. Nuts and bolts shall be lubricated with anti-seize, recommended for use with stainless steel prior to installation. Washers shall be provided for each nut and shall be installed adjacent to the nut, between the nut and the flange. The length of each bolt or stud shall be such that between 1/4 inch and 1/2 inch will project through the nut when drawn tight. Use torque-limiting wrenches to provide uniform bearing and proper bolt tightness. Tighten flange bolts progressively, drawing up bolts on opposite sides gradually until bolts have uniform tightness around the flange. Exposed bolt heads and threads shall be coated with grease.
- C. Flange Wrapping
  - 1. Flanges which connect with buried valves, fittings, couplings, or other equipment shall be wrapped with sheet polyethylene film as specified herein for fittings, valves, and equipment. The wrap shall be extended over the flanges and bolts and secured around the adjacent pipe circumference with tape. For insulating joints, wrapping shall be as specified herein.

#### 3.09 FABRICATED STEEL PIPE AND FITTINGS

- A. Fabrication
  - 1. Reference Standards
    - a. Fabrication shall comply with ANSI B31.3, Chapter V. Welding procedure and performance qualifications shall be in accordance with Section IX, Articles II and III, respectively, of the ASME Boiler and Pressure Vessel Code.

#### B. Welding

- 1. The pipe cylinder shall be fabricated by butt welding, spiral seam, or straight seam. Girth welds shall be limited to two per pipe section, butt welded. Longitudinal welds shall be limited to one seam. Longitudinal joints of adjacent shell courses shall be staggered.
- 2. Field welded joints, if shown and/or allowed by the Engineer, shall be in accordance with AWWA C206.
- 3. The minimum number of passes for welded joints for steel cylinder thickness 0.2500 inches and less shall be two. Three for steel cylinder thickness between 0.2501 and 0.3750 inches. All welds shall be continuous and fully circumferential.
- 4. For the shop fabrication of special fittings and appurtenances, the shielded metal arc welding (SMAW) process shall be used. Other process can be used if approved by the Engineer. All welding shall be done by qualified, certified welders.
- 5. Welds shall be in accordance with ANSI B31.3, paragraph 327.4.
- 6. Welds shall be identified in accordance with ANSI B31.3, paragraph 328.5.
- 7. Welding preparation shall comply with ANSI B31.3, paragraph 328.4.
- 8. Welding preparation shall comply with ANSI B31.3, paragraph 327.3. Limitations on imperfections in welds shall conform to the requirements in ANSI B31.3.
- 9. For the SMAW process, welding electrodes shall comply with AWS A5.1. For the SAW process welding electrodes shall comply with AWS A5.17. For the FCAW process welding electrodes shall comply with AWS A5.20.
- 10. Each layer of deposited weld metal shall be cleaned using a power-driven wire brush prior to depositing the next layer of weld metal. The final pass shall be cleaned by a power-driven wire brush.
- 11. Beveled ends for butt welding shall conform to ANSI B16.25. Slag shall be removed by chipping or grinding. Surfaces shall be clean of paint, oil, rust, scale, slag, and other material detrimental to welding. When welding the reverse side, slag shall be chipped out before welding.
- C. Shop Hydrostatic Test
  - 1. The steel cylinder with joint rings shall be stressed to 75% of the minimum yield stress of the steel.
- D. Shop Testing of Fittings
  - 1. <u>Dye Penetrant Test:</u> Seams in fittings which have not been previously shop hydrostatically tested shall be tested by the dye penetrant method as described in ASME Boiler and Pressure Vessel Code Section VIII, Appendix B.
  - 2. <u>Air-Soap Test:</u> In addition to the dye penetrant method of testing, the air-soap method with air at 5 psi shall be used on joints susceptible to being tested by such a method.
  - 3. <u>Pressure Test in Lieu of Dye Penetrant Test:</u> In lieu of the dye penetrant method of testing, completed fittings may be hydrostatically tested using the field hydrostatic test pressure or 125% of the design pressure, whichever is higher.

### 3.10 COPPER PIPE

- A. Pipe/Tubing Preparation
  - 1. Tubing shall be cut square and burrs removed. Both the inside and outside of fitting and pipe ends shall be cleaned with steel wool and muriatic acid before soldering. Care shall be taken to prevent annealing by over-heating of fittings and tubing when making connections. Miter joints shall not be permitted in lieu of elbows. Notching straight runs of pipe in lieu of tees shall not be permitted.

TS 17-15

- B. Pipe Bends
  - 1. Bends in soft copper tubing shall be long sweep. Bends shall be shaped with shaping tools. Bends shall be formed without flattening, buckling, or thinning the tubing wall at any point.
- C. Brazing
  - 1. Brazing procedures shall be in accordance with Articles XII and XIII, Section IX, of the ASME Boiler and Pressure Vessel Code. Solder shall penetrate to the full depth of the bell in joints and fittings. Solders shall comply with ANSI B31.3, paragraph 328.
- D. Pipe Flexibility and Minimum Cover for Service Laterals
  - 1. Buried piping shall be installed with some slack to provide flexibility in the event of a load due to settlement, expansion or contraction. The minimum depth of cover shown on the Drawings shall be adhered to.
- E. Copper Service Laterals
  - 1. All service laterals shall be the size shown on the Drawings copper tubing. End connections for the corporation stop shall be compression type fittings. All other couplings, fittings and joints shall be silver soldered. Piping for 2-inch size services shall be installed with straight lengths of soft copper water tube Type K.

## 3.11 POLYETHYLENE PIPE

A. <u>Polyethylene piping is allowed for water services.</u> Water service piping from water main to meter shall be one continuous length and shall not have any joints.

### 3.12 COMPLETION OF INTERIOR JOINTS FOR MORTAR-LINED PIPES

- A. Preparation
  - 1. A tight-fitting swab or squeegee shall be inserted in the joint end of the pipe to be joined.
- B. Application of Cement Mortar
  - 1. When ready to insert the spigot, the face of the cement mortar lining at the bell shall be coated with a sufficient amount of stiff cement mortar to fill the space between adjacent mortar linings of the two pipes to be joined.
- C. Removal of Excess Mortar
  - 1. Immediately after joining the pipes, the swab or squeegee shall be drawn through the pipe to remove all excess mortar and expel it from the open pipe end.

### 3.13 PIPELINE CLOSURE ASSEMBLIES

A. Pipeline closure assemblies shall be employed to unite sections of pipeline laid from opposite directions; to adjust the field length of the pipeline to meet structures, tie-ins to existing pipelines, and points established by design stations; and to close areas left open to accommodate temporary test bulkheads for hydrostatic testing.

## B. PVC C900 Pipe

- 1. Closure assemblies shall be an ASTM C 153 ductile iron restrained mechanical joint long sleeve, manufactured by Tyler Union or equal.
- C. AWWA C200 Steel Pipe
  - 1. Unless otherwise shown, closure assemblies shall be butt straps.
    - a. Unless otherwise shown or specified, shaped steel butt straps a minimum of 10inches in width shall be centered over the ends of the pipe sections they are to join. Provide a minimum of 2-inches of overlap on each side and holes for airsoap test. Butt strap thickness shall match pipe at a minimum. Provide backing plate the full width of the joint/splice. On pipes 39 inches in diameter and smaller, butt straps shall be welded to the outside of the pipes with complete circumferential fillet welds equal in size to the thinnest part being joined.
    - b. Submit locations and details for Engineer review and approval.
  - 2. General Requirements for Cement Mortar Lining for Closure Assemblies
    - a. Closure assemblies shall be cement-mortar lined to a mortar thickness at least equal to the adjoining standard pipe sections. The steel shall be cleaned with wire brushes and a cement and water wash coat applied prior to applying the cement mortar. Where more than a 4-inch joint strip of mortar is required, welded wire mesh reinforcement having a 2-inch by 2-inch pattern of No. 12 gauge shall be placed over the exposed steel. The wires on the 4-inch spacing shall be crimped to support the mesh 3/8-inch from the metal surface. The interior mortar shall have a steel-troweled finish to match adjoining mortar lined pipe sections.
  - 3. Lining Closure Assemblies
    - a. Butt straps with 5-inch diameter hand holes shall be provided for lining of closure assemblies on pipelines, as shown.
  - 4. Mortar Coating Exterior Surfaces of Closure Assemblies
    - a. The exterior of closure assemblies shall be reinforced with wire mesh as described in paragraph titled "General Requirements for Cement Mortar Lining for Closure Assemblies" above. The surface shall be coated with mortar, or a poured concrete encasement to cover all steel to a minimum thickness of 1 1/2 inches. Exterior mortar shall be protected to retard drying while curing. Concrete shall be poured and vibrated on one side of the closure assembly only, until mortar is visible on the opposite side, after which the coating can be completed over the top of the assembly.

# 3.14 FIELD WELDED JOINTS

- A. Locations
  - 1. Welded joints shall be provided where detailed on the plans.

- B. Reference Standard
  - 1. Welding shall be in accordance with AWWA C206. Welder's qualification shall be in accordance with Section IX of the ASME Boiler and Pressure Vessel Code. Current certifications shall be provided for all welders.
- C. Sequence
  - 1. Interior joints shall not be welded before backfilling, compaction, and compaction testing are successfully completed.
- D. Joint Rings
  - 1. Joint rings (butt-straps or weld collars) that are rusted or pitted where weld metal is to be deposited shall be cleaned by brushing or sand blasting.

#### E. Restrictions

- 1. Concrete or other coating adjacent to the joint rings shall not be heated.
- F. Cleaning Requirements
  - 1. Each layer of deposited weld metal shall be cleaned using an approariate power-driven wire brush or grinder prior to depositing the next layer of weld metal.

## 3.15 OPERATIONS INCIDENTAL TO JOINT COMPLETION

- A. Hydrostatic Testing
  - 1. Joint completion shall be planned to accommodate temporary test bulkheads for hydrostatic testing.

### 3.16 COMPLETION OF EXTERIOR PIPE JOINT FOR CEMENT-MORTAR COATED PIPE

A. Outside joint recess shall be filled with cement-mortar grout using a fabric form (joint diaper) placed around the joint and secured with steel straps. Grout shall be poured and rodded from one side only until it is visible on the opposite side. After approximately one hour, the joint shall be topped off with additional grout.

### 3.17 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement wrap of all ferrous pipes, fittings (all material types), couplings, and valves buried underground shall be accordance with AWWA C105. Valves, tees, and crosses require two layers of polyethylene encasement wrap.

### 3.18 FLEXIBLE COUPLINGS AND FLANGED COUPLING ADAPTERS

A. Flexible couplings and flanged coupling adapters shall be installed in accordance with the recommendations of the manufacturer. The finished joint shall be watertight under the test pressure of the pipeline. Couplings and adapters shall be wrapped with eight (8) mil. sheet polyethylene film as specified herein.

TS 17-18

### 3.19 IDENTIFICATION AND LOCATOR TAPE

A. Pipe locater tape shall be installed above the pipe as shown and in accordance with Technical Specification titled "Facility Identification."

#### 3.20 TRACER WIRE

A. Tracer wire shall be installed on top of the pipe as shown and in accordance with Technical Specification titled "Facility Identification."

#### 3.21 FLANGE INSULATION KITS

- A. Flange insulation kits shall be installed in accordance with the manufacturer's instructions.
- B. Buried Insulation Kits
  - 1. Flange insulation kits shall not be installed directly against valve flanges. A 24-inch long spool of identical material shall be installed adjacent to the valve (on each side, where applicable) so that the insulating flange kit may be installed on a standard pair of flanges. All buried insulated flanges (and adjacent fittings, pipe spools, and valves) shall be protected with a polyethylene encasement wrap in accordance with AWWA C105 and as specified herein.
- C. Above Ground Insulation Kits
  - 1. All flange and pipe surfaces shall be clean and free of all dirt, grease, water, and other foreign material in accordance with the tape (vinyl plastic electrical tape) manufacturer's requirements prior to installation of tape coating. The two separate 20-mil tapes shall be half-lapped twice over the outer surface of the flange.

#### 3.22 THRUST RESTRAINT AND ANCHOR BLOCKS

- A. Location
  - Thrust restraint and anchor blocks shall be provided on all pressure pipelines and shall be installed as shown on the Plans at all rubber gasketed fittings that are not otherwise restrained. Thrust restraint blocks or anchor blocks shall be installed at all valves, tees, crosses, ends of pipelines, and at all changes in direction of the pipeline greater than five (5) degrees deflection either vertically or horizontally when joints are not otherwise restrained.
- B. General Requirements
  - 1. Concrete for thrust blocks shall be Class C and shall conform to Technical Specification section titled "Concrete Work."
  - 2. Thrust protection shall be set prior to pressurizing the line. Exposed reinforcement shall be coated with one (1) inch of an approved non-shrink grout after the concrete has sufficiently cured. See Technical Specification section titled "Concrete Work."
- C. Thrust Restraint Not Called for on the Drawings
  - 1. Thrust restraint elements, where not called for on the plans, shall be sized for 150 percent of operating pipeline pressure or the pipeline test pressure, whichever is greater.

Prior to construction, thrust and anchor block sizing shall be submitted to the Owner for approval.

- D. Concrete Placement
  - 1. Concrete shall be placed against wetted and undisturbed soil, forms, and the exterior of the fitting. The forms and exterior of the fitting shall be cleaned and wetted to provide a good bond with the concrete. The concrete interface with the fitting shall be an area of not less than the projected area of the fitting normal to the thrust resultant and centered on the resultant. Cure concrete in accordance with Technical Specification section titled "Concrete Work." Concrete shall set prior to pipeline hydrostatic testing.
- E. Disturbed Soil
  - 1. Where soil is disturbed, horizontally and vertically, the Contractor shall extend the excavation line as directed by the Owner. Material, lift thickness, and compaction of the backfill shall be as directed by the Owner.
- F. Accessibility to Joints and Fittings
  - 1. Unless otherwise directed by the Owner, thrust restraint and anchor blocks shall be placed so that the pipe and fitting joints are accessible for repair. Placement shall include isolation of adjacent utilities and shall ensure that the bearing is against undisturbed soil.
- G. Harness and Tie-Rods
  - 1. Metal harness or tie-rods and pipe clamps shall be used to prevent movement if shown on the plans or directed by the Owner. The rods and clamp harnessing arrangement shall be installed utilizing flanged harness holddowns or lugged fittings and pipe with saddle clamps placed (where feasible and practical) to bear against the pipe bells. Saddle clamps around the barrel of the pipe, which depend on friction to prevent sliding of the clamp, are acceptable. However, restraints with pointed set-screws which bear into the pipe wall are not acceptable and shall not be used. All surfaces of exposed and buried non stainless steel rods, reinforcing steel, bolts, clamps, and other metal work shall be coated prior to backfilling, and touched up after assembly as specified in Technical Specification titled "Protective Coatings", System B.
- H. In-line Valves
  - 1. Reinforcing steel tiedowns rods shall be used on all in-line valves. Refer to the Plans for details. Exposed reinforcement shall be coated with one (1) inch of an approved non-shrink grout after the valve pad or anchor has sufficiently cured. Alternatively, the exposed reinforcing steel can be coated with 80 mils of nontoxic cold-applied bitumastic waterproofing compound that conforms to ASTM D1227.

### 3.23 BLOWOFF ASSEMBLIES

A. <u>General:</u> In-line type or end-of-line type blowoff assemblies shall be installed in accordance with the Plans at the locations noted, and at such additional locations as required by the Owner for removing water or sediment from the pipeline.

TS 17-20

### 3.24 ABOVE-GROUND PIPING INSTALLATION/SUPPORT

- A. Installation of aboveground pipeline materials and appurtenances include requirements for buried pipeline materials and appurtenances as applicable.
- B. Supports
  - 1. All exposed pipe shall be adequately supported with devices of appropriate design. Where details are shown, the supports shall conform thereto and shall be placed as indicated; provided, that the support for all piping (existing and new) shall be complete and adequate as herein specified, whether or not supporting devices are specifically called for.
- C. Grooved-End Pipe and Fittings
  - 1. Grooved-end pipe and fittings shall be installed in accordance with the coupling manufacturer's recommendations and the following:
  - 2. Loose scale, rust, oil, grease, and dirt shall be cleaned from the pipe or fitting groove. Lubricate the coupling gasket in accordance with the manufacturer's recommendations. Coupling shall be tightened alternately and evenly until coupling halves are seated properly.

## 3.25 HYDROSTATIC TESTS

- A. All parts of the entire pipeline installation (mains, laterals, blowoffs, valves, air valves, and water services) shall be tested in accordance with applicable sections of AWWA C600 and AWWA C605.
  - 1. Water services shall be tested up to the curb stop.
- B. Connections to existing lines and tests shall be made in the presence of the City of Orland Representative. The Contractor shall notify the Owner at least seventy-two (72) hours prior to installing the testing block and bypass and testing.
- C. The Contractor shall furnish and install a testing block and bypass as shown. The bypass shall be used for filling, flushing, sterilization, and chlorination of the water lines. On exposed water mains, the acceptance test shall be conducted after the piping has been completely installed, including all supports and hangers.
- D. The Contractor shall submit a comprehensive testing plan and a test report for each section.
- E. The Contractor shall provide all labor, tools, and equipment required to perform the hydrostatic tests.
- F. Testing
  - 1. Before the test, the pipeline shall be sufficiently anchored to withstand the test pressure. During the filling of the line with water, precautions shall be taken to prevent air pockets at high points.
  - 2. Water may be allowed to stand in the line for several hours prior to the test. Water shall sit in the line for a minimum of 72 hours for cement mortar-lined pipelines.

- 3. Test pressure shall be 100 PSI or as directed by the Engineer.
- 4. During the test, which shall be conducted for the time period determined by the Owner, but not less than 30 minutes, the leakage shall not exceed 5 gallons per 24 hours per thousand feet of pipe per inch of nominal diameter. Note that the allowable leakage rate for pipeline sections with flanged, welded, and/or grooved-end joints shall be zero.
- 5. The maximum length of pipe to be included in any one test shall not exceed 2,500 feet or the distance between the isolation valves, whichever is greater. Suitable test bulkheads, blocking, and fittings shall be installed as necessary to permit such sectionalizing.
- 6. If any valved section of pipe shows greater leakage than specified, the Contractor shall locate and repair the leaks and shall retest that section of line at no additional cost to the Owner.

# 3.26 FLUSHING AND STERILIZATION OF COMPLETED MAINS

- A. The methods outlined in AWWA C651-14 titled, "Disinfecting Water Mains," shall be used as a guide in performing this operation where applicable. The Contractor shall submit a comprehensive flushing and disinfection plan.
- B. Flushing, disinfection, sampling, and dechlorination shall be made in the presence of the Owner. The Contractor shall notify the Owner at least seventy-two (72) hours prior to Flushing and disinfection activities.
- C. Potable water shall be used for chlorination.
- D. Flushing Completed Lines
  - Before the main is chlorinated, it shall be filled to eliminate air pockets and flushed to remove particulates. The flushing velocity in the main shall not be less than 2.5 feet per second. Flushing is not a substitute for lack of preventive measures during construction. Flushing of completed lines prior to chlorination shall be accomplished as thoroughly as possible with the water pressure and outlets available. The flushing shall be done after the successful pressure tests have been made.
- E. Chlorination of Completed Lines
  - 1. Before being placed in service, the entire pipeline installation (mains, laterals, blowoffs, valves, air valves, and water services) shall be chlorinated. Chlorine shall be applied by one of the following methods: liquid chlorine; sodium or calcium hypochlorite water solution; or chlorine tablets. The chlorinating agent shall be applied at a point not more than ten feet downstream from the beginning of the new main. Water shall be fed slowly into the new main with chlorine fed at a constant rate such that the water will have not less than 25 mg/L free chlorine. The application of chlorine shall conform to AWWA C651-14 and shall be injected through a corporation cock or other connection ensuring treatment of the entire line. Portions of the existing mains which have been connected to a new line or otherwise contaminated by construction shall be included in the system sterilized. A residual of not less than 10 parts per million after 24 hours shall be produced in all parts of the line. During the chlorination process, all valves shall be operated.

TS 17-22

- 2. Water Services
  - a. Every service connection served by a main being disinfected shall be tightly shutoff at the curb stop before water is applied to the main. Care shall be taken to expel all air from the main and services during the filling operation.
  - b. Water services shall be disinfected up to the curb stop.
- 3. Tie-ins
  - a. At water tie-ins, minimum disinfection shall be achieved by swabbing the new pipe sections and fittings with a 5% hypochlorite solution before installation and flushing the main from both directions, if possible, before returning the system to service.

### F. Dechlorination

- 1. Following chlorination and prior to discharge, the water shall be dechlorinated such that a residual of not more than 0.02 parts per million (instantaneous maximum) of chlorine is present in any water discharged.
- 2. Dechlorinated water shall be discharged into the nearest storm drain system.

## G. Final Flushing

1. After chlorination, the water shall be flushed from the lines at the extremities until the replacement water tests are equal, chemically and bacteriologically, to those of the permanent water supply.

# 3.27 SAMPLING

A. The Owner will take necessary samples and submit them for testing. The initial tests will be paid for by the Owner. If initial tests fail the Owner will obtain additional samples and submit for testing at the Contractor's expense. When all tests have been passed, the pipe and fittings shall be sufficiently flushed to cleanse the pipe and fittings of the disinfecting agent. Connections to the Owner's existing water system will only be made when the owner is satisfied that the Contractor has met the requirements of AWWA C651-14.

TS 17-23

B. The Contractor shall coordinate required sampling with the Engineer and City.



TS 17-24

## PART 1 GENERAL

### 1.01 SCOPE

A. This heading covers the furnishing and installation of wet-barrel type fire hydrants, complete.

## 1.02 SUBMITTALS

- A. Submittals shall be furnished in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submit a comprehensive drawing showing the hydrant, break off riser, break off check valve, spool, bury section, and bolts. Show dimensions, materials of construction by ASTM reference and grade, and protective coating and lining. Include manufacturer's catalog data, coating color chart, flange dimensions, flange bolt circles.
- C. Submit proposed locations of fire hydrants prior to construction.

## PART 2 MATERIALS

### 2.01 GENERAL

A. All materials and lubricants shall be NSF 61 and NSF 372 certified for potable water applications.

### 2.02 FIRE HYDRANT

- A. Fire hydrants shall be of the low-profile wet-barrel type, with individual valves for each outlet, and shall conform to the requirements of AWWA C503.
- B. Hydrants shall be designed for 200 PSI working pressure and tested to 400 PSI hydrostatic pressure.
- C. Hydrants shall be permanently marked to identify the model number of the hydrant, the manufacturer, the year the hydrant was manufactured and the rated working pressure.
- D. A flanged extension riser with a break-off groove, flanged break-off check valve, and a flanged spool, shall be installed below the hydrant and above the bury section.
- E. The hydrant shall be mounted with breakaway bolts.
- F. The flange dimensions and bolting patterns of the fire hydrant, break-off riser, check valve, spool, and bury section shall be compatible.
- G. Outlets
  - 1. Fire hydrants shall have two (2) 2-1/2-inch hose outlets and one (1) 4-1/2-inch pumper outlet. Outlets shall be individually valved, and operating valve parts shall be brass or bronze, with O-ring seals. All outlet nozzles shall be field removable.
- H. Materials of Construction
  - 1. The hydrant head shall be made of iron, gray or ductile. All interior working parts, including stems, shall be of copper alloy bronze.

TS 18-1

- I. Operating Nuts
  - 1. Fire hydrants shall be provided with 1 1/2-inch sized pentagon-shaped operating nut and 1 1/2-inch cap nuts.
- J. Outlet Caps and Chains
  - 1. Outlets shall be threaded National Standard and shall be equipped with protective screwon caps (iron) with inner gaskets, attached to the hydrant barrel with steel security chains.
- K. Flanges
  - 1. Fire hydrant, break-off riser, check valve, spool, and bury section flanges shall be drilled with a 6-hole pattern. The flange shall be 11 7/16-inch O.D. with drilled 3/4-inch diameter holes located on a 9 3/8-inch bolt circle.
- L. Manufacturer Identification
  - 1. Fire hydrants shall have the name of the manufacturer cast or welded onto the fire hydrant body.
- M. Manufacturers
  - 1. Fire hydrants shall be Clow Valve Company Model 960 or approved equal.
- N. Maintenance Kits
  - 1. A maintenance kit shall be provided for each fire hydrant assembly.

#### 2.03 BREAK-OFF RISER

A. Cast iron break-off risers shall be provided for each hydrant installation as shown on Detail 1, Fire Hydrant Installation on DWG. No. CG-02. Each spool shall have a scored groove placed circumferentially around the spool near the hydrant end of the spool. The score shall be placed above-grade. Only one score shall be made in the hydrant break-away spool piece. Breakoff-off riser flanges shall match both the hydrant and break off check valve.

#### 2.04 SPOOL

A. Heavy cast-iron or ductile iron flanged spools risers shall be provided for each hydrant installation as shown on Detail 1, Fire Hydrant Installation on DWG. No. CG-02. Spool flanges shall match both the break off check valve and bury section.

### 2.05 BURY SECTION

- A. The hydrant bury shall be 6-inch diameter heavy cast-iron or ductile iron pipe conforming to AWWA C503 with a machined flange top/outlet and a mechanical joint bottom/inlet connection.
- B. Bury Depth
  - 1. Unless otherwise shown or specified, the bury depth shall be a minimum of 36-inches. Field conditions may require different depth fire hydrant buries to fit abnormal pipe or conditions, as approved by the Engineer.
- C. Manufacturer
  - 1. Hydrant bury sections shall be Sip Industries or approved equal.

### 2.06 BREAK OFF CHECK VALVE

A. Break off check valve shall have a ductile iron body, cast iron extension, copper alloy flapper, rubber gasket, and stainless steel parts (hardware, pin, break off bar, plug, spring, etc.).

### B. Manufacturer

1. Break off check valve shall be Clow Valve Company Model LBI 400A or approved equal.

## 2.07 COATING AND LINING

- A. General
  - 1. All above ground portions of the hydrant and break off riser shall be coated in accordance with Specification Section titled "Protective Coatings", System E.

### B. Hydrant

- 1. Hydrant interior shall be coated with fusion-bonded epoxy in accordance with AWWA C550.
- 2. Hydrant exterior shall be coated in accordance with Technical Specification titled "Painting and Coating", System E.
- C. Breakoff Riser
  - 1. Fusion-bonded epoxy lined and coated in accordance with Technical Specification titled "Painting and Coating", System C.
- D. Break Off Check Valve
  - 1. Check valve shall be fusion-bonded epoxy lined in accordance with AWWA C550 and coated with Triglycidyl Isocyanurate (TGIC) powder coating in accordance with the standards of the listed manufacturer. Alternate coating systems can be submitted for Engineer review and acceptance.
- E. Spool
  - 1. Ductile iron pipe shall be cement-mortar lined and bituminous coated in accordance with AWWA C104 and AWWA C151, respectively.
- F. Bury Section
  - 1. Ductile iron pipe shall be cement-mortar lined and bituminous coated in accordance with AWWA C104 (double thickness for fittings) and AWWA C151, respectively.

# 2.08 BREAKAWAY BOLTS

A. Breakaway bolts shall be zinc plated carbon steel alloy break-away bolts in accordance with ASTM A307 that are silicon filled shall be used to join the breakaway spool/riser section to the hydrant top section. Steel SAE washers shall be placed between the hydrant flange and the cad-plated nuts. Silicone filled breakaway bolts shall be TRIPAC or approved equal.

### 2.09 ISOLATION VALVE

A. The isolation valve on the fire hydrant lateral shall be a gate valve per Technical Specification titled "Valves and Appurtenances."

#### 2.10 BOLTS, NUTS, AND WASHERS FOR FLANGES

A. With the exception of the breakaway bolts, bolts, nuts, and washers for flanges shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 2.11 GASKETS

A. Gaskets for flanged joints shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

#### 2.12 TRACER WIRE

A. Tracer wire shall be in accordance with specification section Technical Specification titled "Facility Identification."

#### 2.13 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

#### PART 3 EXECUTION

#### 3.01 GENERAL

A. Hydrant assemblies shall be installed as shown and as specified herein.

#### 3.02 LOCATION

- A. Fire hydrants shall be installed as shown.
- B. All hydrant locations shall be approved by the Engineer and the City Orland Fire Department prior to construction. The Contractor is responsible for all coordination.

### 3.03 BREAKAWAY BOLTS

A. Break-away bolts shall be installed with the threads toward the top of the hydrant. Bolts shall be factory packed with clear silicon sealant.

#### 3.04 VALVE AND VALVE BOX

A. The valve and valve box for the fire hydrant lateral isolation valve shall be installed as shown and in accordance with Technical Specification titled "Valves and Appurtenances."

### 3.05 TRACER WIRE

A. Tracer wire for fire hydrant laterals shall installed be in accordance with Technical Specification titled "Facility Identification."

TS 18-4

### 3.06 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement for buried ferrous metal pipe, fittings, valves, and couplings shall be installed in accordance with Technical Specification titled "Water Pipe and Fittings."

### 3.07 CONCRETE

A. Concrete material for and placement of thrust blocks shall be in accordance with Technical Specification titled "Water Pipe and Fittings."

## 3.08 COATING

A. All above ground portions of the hydrant and break off riser shall be coated in accordance with Specification Section titled "Protective Coatings", System E.

## 3.09 TESTING AND DISINFECTION

A. Hydrants shall be installed, tested, and disinfected at the same time that the connecting pipeline is pressure tested and disinfected in accordance with AWWA M17 (Chapter 4) and Specification Section titled "Water Pipe and Fittings."



## PART 1 GENERAL

## 1.01 SCOPE

A. This section covers meter assemblies and appurtenances, complete.

## 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submit items listed herein in accordance with Technical Specifications titled "Valves and Appurtenances", "Water Pipe and Fittings", and "Facility Identification."

## PART 2 MATERIALS

## 2.01 WATER SERVICE METERS

A. Water service meters shall be furnished by the Owner. Contractor shall coordinate with Owner to establish pickup location of meters and deliver to the project site.

## 2.02 WATER SERVICE PIPING

A. Water service piping shall be as shown on the Plans and in accordance with the Technical Specification titled "Water Pipe and Fittings."

### 2.03 WATER SERVICE LINE VALVES

A. Water service line valves shall be as shown on the Plans and in accordance with the Technical Specification titled "Valves and Appurtenances."

### 2.04 METER BOX

A. Meter boxes shall be as shown on the Plans and in accordance with the Technical Specification titled "Valves and Appurtenances."

### 2.05 TRACER WIRE

A. Tracer wire material shall be in accordance with Technical Specification titled "Facility Identification."

# PART 3 EXECUTION

### 3.01 GENERAL

A. Before installation, carefully clean valves of all foreign material, and inspect valves in open and closed positions. Install valves in accordance with the applicable portions of these Specifications. Unless otherwise indicated, install valves with the stem vertical. Mount horizontal valves so that adequate clearance is provided for operation. Installation practices shall conform to manufacturer's recommendations.

TS 19-1

- B. Prior to installing flanged valves, the flange faces shall be thoroughly cleaned. After cleaning, insert the gasket and tighten the nuts progressively and uniformly. If flanges leak under pressure, loosen the nuts, reseat or replace the gasket, re-tighten the nuts, and retest the joint.
- C. Thoroughly clean threads of screwed joints by wire brushing, swabbing, or other approved method. Apply approved joint compound to threads prior to making joint. Joints shall be watertight at test pressures before acceptance.

#### 3.02 METERS

A. Residential meters shall be installed by the Contractor. The Contractor shall coordinate with the Engineer and have all required items installed, as shown on the Plans, to facilitate meter installation, testing, and disinfection. Contractor is not responsible under this Contract for installing service piping past the water meter (e.g. backflow preventer and piping to connect to residence from meter).

#### 3.03 VALVES

A. Service line valves shall be installed as shown on the Plans, as specified herein, and in accordance with the Technical Specification titled "Valves and Appurtenances."

#### 3.04 WATER SERVICE PIPING

A. All piping for water service lines shall be installed in conformance with Technical Specifications titled "Trench Excavation and Backfill" and "Water Pipe and Fittings."

#### 3.05 METER BOXES

- A. Meter boxes shall be installed as shown on the Plans.
- B. Line and Grade
  - 1. Meter boxes shall be set true to line and to the grade of the top of the curb, sidewalk. For landscaped, or other unpaved surfaces, the meter box shall be set with the top 2 inches above the adjacent surrounding area, or as directed by the City of Orland Representative in the field. The Contractor is responsible for placing the cover at the proper elevation and slope and shall make all necessary adjustments so that the cover meets these requirements.
- C. Sequence of Installation
  - 1. Meter boxes shall not be set until fine grading or landscape grading in the vicinity has been completed.

#### 3.06 PAINTING AND COATING

A. Exposed piping and meter lids on all potable water services shall be painted or coated in accordance with Technical Specification titled "Protective Coatings", System A.

#### 3.07 TRACER WIRE

A. Tracer wire shall be installed on top of the pipe and inside the meter box as shown and in accordance with Technical Specification titled "Facility Identification."

TS 19-2

### 3.08 TESTING AND DISINFECTION

A. Water service meter shall not be hydrostatically pressure tested and disinfected during the testing and disinfection of the pipeline in accordance with Technical Specification titled "Water Pipe and Fittings." Water services shall be hydrostatically pressure tested and disinfected up to the curb stop only.



## PART 1 GENERAL

### 1.01 SCOPE

A. This section describes materials and installation of potable water facilities identification for pipe, valves, valve boxes, fire hydrants, water services, blow offs, and other pipeline appurtenances.

#### 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submit manufacturer catalog cutsheets and specifications for locator tape, tracer wire, terminal boxes, grounding rod, splice kits, attachment tape, and appurtenances.
- C. If required by the Engineer, submit material samples of locator tape.
- D. Submit proposed method of connecting to existing identification/locating systems.
- E. Submit locations of all tracer wire dead ends, proposed and as-built locations of all tracer wire access boxes, proposed locations of all spliced connections, tracer wire testing firm qualifications, tracer wire testing plan and procedures, and tracer wire continuity test results.

#### PART 2 MATERIALS

#### 2.01 BURIED PIPING LOCATOR TAPE

- A. Buried Piping Locator Tape shall be solid aluminum foil core detectable tape and be installed for all potable water pipelines 1-inch and larger. The tape shall have a minimum thickness of 5 mil and be manufactured using a 0.8 mil clear virgin polypropylene film, reverse printed and laminated to a 0.35 mil solid aluminum foil core, and then laminated to a 3.75 mil clear virgin polyethylene film. Tape wording shall be: "CAUTION POTABLE LINE BURIED BELOW." APWA Color Code: Blue.
- B. The overall width of the tape and lettering size shall be in accordance with the following table.

Pine Size	Locator Tape Width	Min Lettering Size
(inches)	(inches)	(inches)
	(incries)	
2 and less	2	1.5
Less than 8 and greater than 2	2	1.5
8 and larger	2	1.5

C. Detectable locator tape shall be as manufactured by Pro-Line Safety Products Company, T. Christy Enterprises, or approved equal.

### 2.02 EXISTING IDENTIFICATION/LOCATING SYSTEMS

A. In installations where existing piping identification/locating systems have been established, the Contractor shall continue to use the existing system. Where existing identification/locator systems are incomplete, the Contractor shall utilize the existing system as far as practical and supplement

with the specified system. The objective is to fully identify all new piping, valves, and appurtenances to the level specified herein.

### 2.03 TRACER WIRE

- A. Tracer wire shall be direct bury type 10 AWG solid copper with High Molecular Weight Polyethylene (HMWPE) insulation (30 mil thickness minimum). The insulation shall be blue in color. Tape for securely attaching the tracer wire to the pipe shall be Polyken 900, or equal.
- B. The wire shall be electrically continuous throughout the entire piping system.
- C. Splices
  - 1. All buried mainline splices shall be 3M DBR direct bury watertight connectors or approved equal shall be used to provide electrical continuity.
  - 2. Branch connection (water services, fire hydrant laterals, blowoffs, etc.) tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. DryConn Direct Bury Lug Aqua water tight connectors, or approved equal, shall be used to provide electrical continuity.
  - 3. If approved by the Owner, splices located within structures shall be 3M DBR direct bury watertight connectors or as shown on the Plans.
- D. If shown or required by the Engineer, grounding rods shall be Copperhead 1.5 lb. drive-in magnesium anode or approved equal.
- E. Where tracer wire is not brought to the surface inside valve or meter boxes, at grade terminal boxes shall be traffic rated, constructed of a cast iron body with a blue high-strength resin two terminal switchable lid, and be equipped with an encapsulated magnet for easy detection. At grade terminal boxes shall be Copperhead SnakePit Roadway or approved equal.

### PART 3 EXECUTION

#### 3.01 PIPE LOCATOR TAPE

- A. Unless otherwise shown on the Drawings, locator tape shall be installed 12-inches above the pipe and shall be centered over all pipelines, including lines to fire hydrants, blowoffs, water services, and air valves.
- B. Tape shall be installed/buried flat without kinks or tears. The tape shall be installed continuously for the entire length of the pipe.

### 3.02 EXISTING IDENTIFICATION/LOCATING SYSTEMS

A. The Contractor shall submit a proposed method of connecting to existing identification/locating systems prior to construction for Engineer review and approval.

## 3.03 TRACER WIRE

A. Unless otherwise shown on Drawings, tracer wire shall be installed in conjunction with locator tape on all pipelines, including lines to fire hydrants, blowoffs, water services, gate valves, and air valves.

- B. Tracer wire shall be installed as shown on the Drawings.
- C. Tracer wire shall be installed with all pipelines, centered on and just above the top or crown of the pipe.
- D. The wire shall be installed in such a manner as to be able to properly trace all pipelines, laterals, and services without loss or deterioration of signal or without the transmitted signal migrating off of the tracer wire.
- E. The tracer wire shall be securely taped to the pipe every 8 to 10 feet, and on each side of a valve or fitting.
- F. At each valve, air valve, blind flange, water service, fire service, fire hydrant, blowoff, and connection to existing pipelines, the wire shall be brought up to the surface as shown on the Drawings.
- G. At fire hydrants, the tracer wire shall terminate by using Engineer approved means of connecting to an upper fire hydrant bolt at the break off riser.
- H. Except for approved splice connections, the tracer wire shall be continuous and without splices from each tracer wire access point. Where any approved spliced-in connections occur, when not located in a structure only direct bury watertight connectors as specified herein shall be used to provide electrical continuity. Splices located within structures shall be direct bury watertight connectors or as shown on the Plans.
- I. Spliced connections between the main line tracer wire and branch connection tracer (e.g. service lines) wire shall only be allowed at water main tees, crosses, or at iron or copper water services where a portion of the branch connection water main or water service is replaced with non-iron or non-copper material. The branch connection tracer wire shall be a single tracer wire properly spliced to the main line tracer wire. Where the existing branch connection is neither iron nor copper, then the new branch connection tracer wire shall be properly spliced to the existing tracer wire on the branch connection.
- J. At tees, the three wires shall be joined using a single 3-way lockable connector. At crosses, the four wires shall be joined using a 4-way connector.
- K. Protect wire insulation from damage during installation and backfilling. Wire insulation that is broken, cut, or damaged shall be replaced.
- L. Tracer wire on all water services shall terminate in the meter box.
- M. Tracer Wire Access Points
  - 1. Tracer wire access points shall in general be at every mainline valve box, air valve, fire hydrant, water service meter box, blowoff valve box, and other locations as shown. Concentrations of multiple proposed valves near pipe intersections, i.e. tees or crosses, may require more than one access point assembly in each valve box. Tracer wire access points shall be within the City or County right of way or within Owner acquired easements.
  - 2. Spacing between tracer wire access points shall be 1,500 feet or less. Contractor shall provide and install access boxes ay Engineer approved locations as required to meet this requirement.

- 3. Tracer wire access box
  - a. Specifically manufactured for this purpose, shall be approved by the Engineer.
  - b. All grade level/in-ground access boxes shall be appropriately identified with "water" cast into the cap and be APWA color coded.
  - c. All trace wire access boxes shall include a manually interruptible conductive/connective link between the terminal(s) for the trace wire connection and the terminal for the grounding anode wire connection.
  - d. Provide concrete collar per valve box detail shown.
- N. If shown or required by the Engineer, tracer wire shall be properly grounded at all dead ends and stubs. Grounding of tracer wire shall be achieved by use of a drive-in magnesium grounding anode rod with a minimum of 20 feet of copper wire connected to an anode (minimum wight of 1.5 pound) specifically manufactured for this purpose and buried at the same elevation as the utility.
- O. Where existing tracer wire is encountered on an existing utility that is being extended or tied into, the new and existing tracer wire shall be connected using and Engineer approved splice connectors, shall be properly grounded at the splice location as specified, and shall be completely waterproof to prohibit corrosion and loss of conductivity.
- P. Provide as-built stations and offsets from the main line for all tracer wire valve box locations.

## 3.04 TRACER WIRE TESTING REQUIREMENTS

- A. The Contractor shall notify the Engineer that the tracer wire is ready for testing.
- B. The Contractor shall retain a third-party specialist to facilitate a continuity test on the tracer wire. The Contractor shall submit a certified report by the third-party testing service stating that the tracer wire is performing satisfactorily.
- C. The Contractor shall perform a continuity test on all tracer wire in the presence of the Engineer. This verification shall be performed upon completion of rough grading and prior to final pavement.
- D. All tests made must be reviewed and approved by the Engineer before the work is accepted. The Engineer reserves the right to spot check any or all tests performed. All construction defects must be repaired and retested before the final acceptance is made.
- E. If the tracer wire is found to be not continuous after testing, the Contractor shall repair or replace the failed segment of the wire as specified herein to the satisfaction of the Engineer at no additional cost to the Owner.

### PART 1 GENERAL

### 1.01 SCOPE

A. This Section covers the work necessary to furnish and install fabricated metalwork, anchors, and miscellaneous items, complete.

## 1.02 SUBMITTALS

- A. Submittals shall be furnished as specified herein and in accordance with General Conditions, Special Conditions, and SSPWC Subsection 3-8.
- B. Submittals shall include shop drawings of installation and catalog cuts of materials used.

## PART 2 MATERIALS

## 2.01 GENERAL

A. All materials used shall be new, of the kind, composition, and physical properties best adapted to their various uses in accordance with best engineering practices. The type of metals to be used shall be as specified herein or as shown on the Drawings, or if not so specified or shown shall be commercial grade products suitable for the intended use, as approved by the Owner.

## 2.02 MATERIAL STANDARDS

- A. Materials shall conform to the following standards:
  - 1. Structural steel shapes, plates and bars unless noted otherwise: ASTM A36.
  - 2. Stainless steel plates and bars: ASTM A240, 316L.
  - 3. Pipe for railing: ASTM A513, type 5.
  - 4. Anchor rods: ASTM F1554 Grade 36 threaded rod.
  - 5. Heavy hexagonal nut: ASTM A563, Grade C.
  - 6. Flat washer: ASTM F436.
  - 7. High strength bolts: ASTM F3125 Grade A325.
  - 8. Stainless steel bolts: ASTM F593 Type 316.
  - 9. Stainless steel nuts and washers: ASTM F594 Type 316.
  - 10. Welding electrodes: AWS Type E60XX or E70XX series
  - 11. Floor plate; checkered plate; raised pattern plate: ASTM A786, high strength low alloy carbon steel, flat back style, standard raised pattern No. 1, 4, or 5. Plate thickness as shown on the Drawings. Provide all plate in a single pattern and hot dip galvanized.

### 2.03 MECHANICAL ANCHORS

- A. Mechanical anchors shall be stainless steel, suitable for dynamic loading, and minimum embedment shall be 5 inches or as shown.
- B. Mechanical anchors shall be stud or shell type as identified in the Caltrans authorized materials list and Caltrans 2022 Standard Specification Section 75-3.02C.

### 2.04 UNISTRUT CHANNELS

- A. Unistrut channels shall be ASTM A1011 SS GR 33 with a Hot Dipped Galvanized finish and 1-5/8 inch width.
- B. Unistrut channels shall be solid as specified in the drawings and from the Unistrut Service Company or approved equal.

### 2.05 METAL STRAP

A. Metal straps shall be galvanized 14-Gauge steel straps anchored to headwall as shown in the drawings with 0.25-inch by 2-inch Tapcon Blue Climaseal Hex Head Screws and 0.75-inch washers centered 2-inches from the ends of the straps.

### 2.06 LINK SEAL

- A. Link seal shall be a modular, mechanical type seal, consisting of rubber links shaped to continuously fill the annular space between the pipe and the abutment. The elastomeric element shall be sized and selected per the manufacturer's sizing procedure.
- B. Each individual link shall have permanent identification of manufacturer's name and model number molded into the pressure plate and sealing element.
- C. Link Seal pressure plates shall be molded of glass reinforced nylon. Hardware shall be 316 Stainless Steel, Per ASTM F593 with an average tensile strength of 85,000 psi, average. Coloration shall be throughout elastomer for positive field inspection.
- D. Link-Seal Modular Seal components and systems shall be domestically manufactured at a plant with a current ISO-9001:2015 registration. Copy of ISO-9001:2015 registration shall be a submittal item. Link-Seal modular seal assembly shall be manufactured by GPT or approved equal.

### 2.07 WATER STOP SEALANTS

- A. Flexible, watertight joint sealant shall be used to seal the annular space between the pipe and cast-in-place or pre-cast concrete.
- B. Sealant shall be 2-component, polysulfide sealant, non-sag, Sika Duoflex NS or approved equal.

### 2.08 FABRICATION – GENERAL REQUIREMENTS

A. All parts shall be accurately fabricated to American standard gauge so as to facilitate replacement and repairs. All commercial bolts, nuts, screws, threads, pipe, gauges, and measurements or dimensions shown on the Drawings shall be in United States standard units. Fabrication work shall be square, plumb, straight and true, accurately fitted, with tight joints and intersections, and neat in appearance. Members shall have sharply defined profiles and be free from twists, bends and defects impairing strength and durability. All burs, sharp edges, and protrusions on metal items shall be removed. Items not meeting these requirements will be rejected by the Owner.

- B. Bolted Connections
  - 1. Threads shall be with cut threads, Class 2A; threads for nuts shall be Class 2B. Connection bolts shall be of proper length to permit full thread in the nut, but to not project more than ¼ inch. Holes shall be made by drilling; slotted holes shall be machined. Burning shall not be allowed. Poor matching of holes shall be cause for rejection.
- C. Welding
  - Electrodes for manual welding of carbon steel shall be low hydrogen and shall conform to AWS A5.1 or AWS A5.5; electrodes for machine welding per Section 4, of AWS D1.1; electrodes for manual welding of stainless steel per AWS A5.9. Electrodes for manual welding of stainless steel shall be of compatible material. Electrodes and fluxes shall be maintained clean and free of moisture in conformance with Section 4 of AWS D1.1. Welds shall be smooth and regular, solid and homogenous throughout, and free from pits, slag, scale and other defects. Where exposed to weather, welds shall be continuous, unless otherwise noted.
- D. Cutting
  - 1. Low carbon structural steel shall be cut by torches, shears, or saws. Flame cutting of materials other than low carbon structural steel shall be subject to approval by the Owner. The cutting flame shall not overheat the adjacent metal. An approved mechanical guide shall be used to guide the path of the torch. Torch cuts shall be chipped, ground, or machined to sound metal. Edges to be welded shall be prepared in accordance with the applicable requirements of AWS D1.1. Other edges shall be smooth and free of notches and gouges. All edges shall be slightly rounded by grinding.
- E. Assembly
  - 1. Metalwork shall be assembled and coated in the fabrication plant or prior to installation, insofar as it is practicable. Each assembly shall be checked to ensure that clearances have been provided and that binding does not occur in any moving or removable parts. Parts shall be cleaned thoroughly of packing compounds, dirt, dust, grit, or other foreign matter before assembly. Pipe wrenches, cold chisels, and other tools which would damage the surface of rods, bolt heads, nuts, or other parts shall not be used.
- F. Protective Coating
  - Except for stainless steel materials and unless otherwise shown on the Drawings, all steel shall be galvanized after fabrication. Galvanizing shall conform to ASTM A123 or A153, as applicable. Field applied Cold Galvanizing Compound (Touchup) shall be ready-mixed zinc-rich coating containing 95 percent metallic zinc by weight, brush applied. Approved products are: Galvicon of Kenco Division, Southern Coatings, Inc., Sumter, SC; ZRC of ZRC Chemical Products Co., Quincy, MA; Galvanox Type I of Subox Coatings Div., Carboline Co., Hackensack, NJ; or approved equal.

### PART 3 EXECUTION

### 3.01 HANDLING AND TRANSPORTING

A. Metalwork shall be handled, loaded, transported, and unloaded by procedures and means that will not excessively stress, deform, or otherwise damage the materials. Trucks, trailers and railway cars used for transporting shall be provided with padded bolsters and shall use padded ties. Structural steel members and packaged materials shall be protected from corrosion and other deterioration. Materials shall be stored in a dry area and shall not be placed in contact with the ground. The Contractor shall repair or replace damaged materials as directed by the Owner.

# 3.02 INSTALLATION OF METALWORK

- A. Installation of all metal fabrications shall conform to the AISC Code of Standard Practice for Steel Bridges and Buildings and shall be in accordance with the Drawings and the approved shop drawings, true and horizontal and perpendicular, as the case may be, plumb, level and square, with angles and edges parallel with related lines of the work.
- B. Shop fabricated items subject to damage shall be braced and carefully handled to prevent distortions or other damage.
- C. Embedded metalwork shall be set accurately in position when concrete is placed and supported 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 Technical Specification titled "Concrete Work."
- D. Following installation, assemblies shall be checked for proper fit and functioning, and any necessary corrections shall be made by the Contractor as approved by the Owner. Corrections needed due to installation errors, omissions, or damage by the Contractor shall be made at the Contractor's expense by Owner approved methods. Fabrication tolerances shall be: maximum variation from plumb = ¼ inch; maximum offset from true alignment = ¼ inch.

# 3.03 COATING

- A. Repair paint on metal fabrications in accordance with Technical Specification titled "Protective Coatings."
- B. Galvanized Coating Shop Repair
  - 1. Repair shop damaged and uncoated areas of hot dip galvanized coating according to ASTM A780.
- C. Galvanized Coating Field Repair
  - Metal with damaged galvanized surfaces either shall be repaired or replaced at the option of the Owner, and at no additional cost to the Owner. Field repair of galvanized surfaces shall be affected with Galvanox repair compound, as manufactured by Subox, Inc., Z.R.C. Cold Galvanizing Compound, as manufactured by ZRC Products Company, or approved equal.

### 3.04 CONCRETE ANCHORS

A. Installation shall not begin until the concrete receiving the anchors has attained its design strength. An anchor shall not be installed closer than six times its diameter to either edge of the concrete, or to another anchor, unless specifically detailed otherwise on the Drawings. Install in strict conformance with manufacturer's written instructions. Use manufacturer's recommended drills and equipment.

## 3.05 UNISTRUT CHANNELS

A. Unistrut channel installation shall be in strict conformance with manufacturer's written instructions. Use manufacturer's recommended connection hardware and equipment.

### 3.06 LINK SEAL

A. Link seal installation shall be in strict conformance with manufacturer's written instructions.

## 3.07 WATER STOP SEALANT

A. Water stop sealant installation shall be in strict conformance with manufacturer's written instructions.

TS 21-5



TS 21-6