

## **REQUEST FOR BIDS**

### **Huckleberry Flat Pipeline Project at Memorial County Park**

*Sponsored by the*  
**SAN MATEO RESOURCE CONSERVATION DISTRICT**

1/30/2019

**Published by the authority of:**  
San Mateo RCD Board of Directors  
80 Stone Pine Rd, Suite 100  
Half Moon Bay, CA 94019  
(650) 712-7765

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## REQUEST FOR BIDS

### 1. Introduction

The San Mateo Resource Conservation District (RCD), in partnership with San Mateo County Parks Department (Department) welcomes contractors to bid on the Huckleberry Flat Pipeline Project at Memorial County Park (Project) located in Pescadero Creek County Park, in San Mateo County, CA. The project aims to replace an outdated pipeline which connects the Huckleberry Flat campground and adjacent fire station/parks facilities to the Memorial Park water system.

The purpose of this request for bids is to select a contractor (Contractor) for the Project to conduct the following implementation activities: (1) replacement of the Huckleberry Flat pipeline; (2) removal of spoils material as laid out in the specs package; (3) reconnecting the new pipeline to the existing system; and (4) winterizing the site. Implementation of these measures will create water security for County Parks, minimize the chance of catastrophic leaks occurring within the water system, and allow more water to be left instream for threatened and endangered steelhead trout and coho salmon.

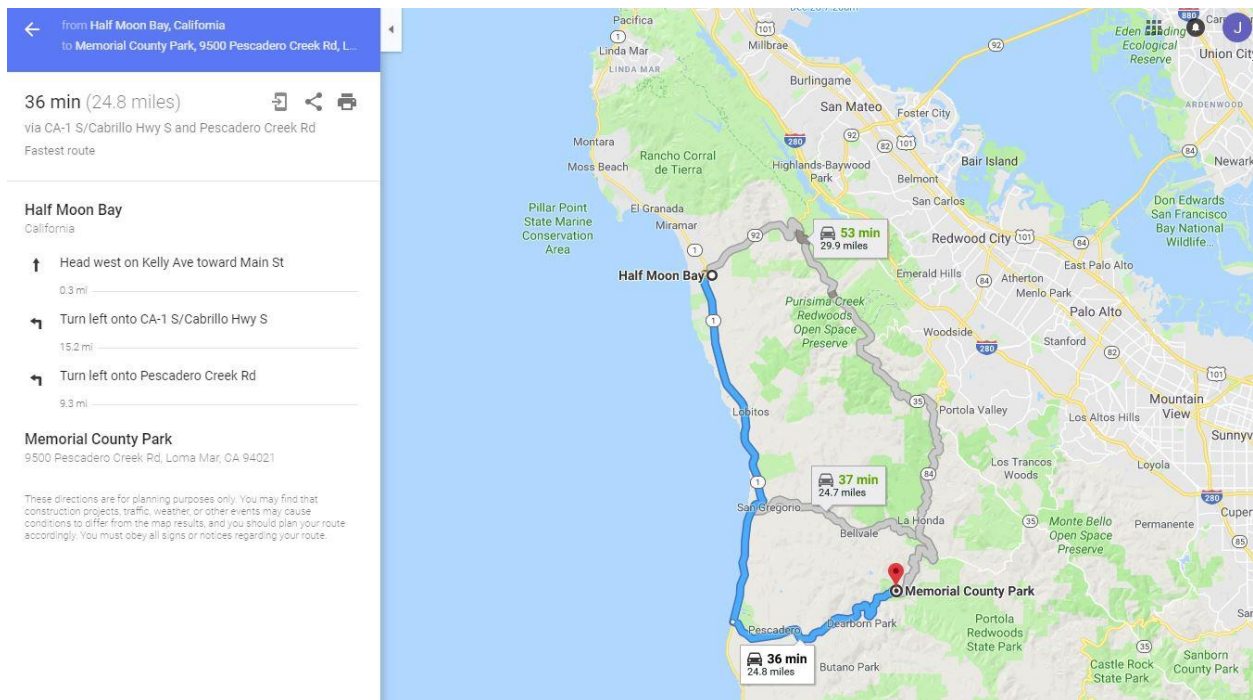
Contracting Entity: The RCD is the contracting entity and project manager on behalf of the landowner, the Department. The RCD is a non-regulatory public benefit district that helps people protect, conserve, and restore natural resources through information, education, and technical assistance programs. The RCD is a division of state government under Division 9 of the Public Resources Code.

Notice of Funding: Bidders are notified that this project is funded by the Department and through the Department of Water Resources (DWR). DWR funds for these projects were appropriated through Proposition 84 round 3 of the Integrated Regional Water Management (IRWM) Implementation Grants; Grant Agreement #4600010883. The RCD may not pay the contractor until grant funds are received from the funding agencies, which is normally between 90 and 120 days from the approved pay request by DWR (approximately 30% of total project budget) and 30 days from the approved pay request by the Department (approximately 70% of total project budget). The RCD invoices DWR and the Department on a quarterly basis but may be able to pay invoices sooner if the RCD can secure bridge funding.

### 2. Location

The project site is located within Pescadero Creek County Park located at 9500 Pescadero Creek Rd, Loma Mar, CA 94021 (see site location map).

Driving directions: From La Honda head west on Highway 84 to Pescadero Creek Road. Make a left (heading south) on Pescadero Creek Road. Travel southwest on Pescadero Creek Road to the entrance to Memorial County Park, approximately 6.5 miles and make a right.



### 3. Plans and Work Sites

The submission of a bid shall constitute certification by the bidder of the following:

- A. The bidder has thoroughly examined and understands the provided information in the Request for Bids and all Exhibits.
- B. The bidder has attended the pre-bid meeting with RCD, Department staff and the project engineer at the project site to familiarize themselves with local conditions that in any manner affect cost, progress, or performance of the work. The purpose of this meeting is to allow prospective bidders to ask questions concerning the work and to make sure they understand the scope of work, permit conditions and environmental constraints.
- C. The bidder is satisfied as to the conditions to be encountered, as to the character, quality, and scope of work to be performed, the quantities of materials to be furnished and as to the requirements of the plans and specifications, and recognizes that: the plans used for the drawings of the work may differ from the actual physical site; dimensions in the plans are approximate, and before proceeding with the work, it will be the Contractor's responsibility to check the site in relation to the drawings and specifications. Report any discrepancies to the RCD.
- D. The bidder has familiarized themselves with all federal, state and local laws, ordinances, rules, and regulations that in any manner affect the cost, progress, or performance of the work.

### 4. Scope of Work

Bids shall include costs for furnishing all labor, equipment, and materials necessary to perform all work as described in Exhibit A.

**Labor and equipment:** Bids shall include costs for furnishing necessary labor and equipment to carry out all tasks detailed in Exhibit A.

- Subcontracts are allowable for specialized work. Subcontractors are subject to approval by the RCD and should be identified on the Cost Proposal form.
- Labor costs (including subcontractor labor costs) shall be based on current prevailing wage rates (see section entitled “Wages” below).

- Equipment costs shall include all fuel costs. Added fuel surcharges not included in the bid will not be paid.

Materials: All required materials and any associated delivery costs shall be included in the bid.

## 5. Project Cost and Funding

Funding for the project is through grants from the Department of Water Resources (DWR, Grant Agreement #4600010883) and the Department.

The estimated cost range for this project is between \$300,000 – \$500,000 (depending on type of soil encountered).

## 6. Documentation

Attached to this request for bids are copies of project and contract documents, including the following:

Exhibit A: Project plans and specifications (Plans and Specifications) and relevant reports

Exhibit B: Cost Proposal Form

Exhibit C: Sample Contract

Exhibit D: Insurance Requirements

Exhibit E: Certificate of Compliance

Exhibit F: Labor Compliance Program

Exhibit G: Billing Instructions for Contractors

Additional project specifications and information may be provided at the pre-bid tour. Bidders are expected to thoroughly examine and understand the contents of each of these documents, which contain pertinent and specific information regarding all aspects of project construction and administration.

## 7. Proposal and Work Schedule

Date of announcement	1/30/2019
RSVP Bid Tour	2/5/2019 RSVP via email to Jarrad Fisher at <a href="mailto:jarrad@sanmateoRCD.org">jarrad@sanmateoRCD.org</a>
Pre-Bid Tour	2/7/2019 – 11am to 12:30pm
Questions/Inquiries Accepted	2/7/2019 – 2/18/2019 Must be received by 5pm (PST) on 2/18/2019 via email to Jarrad Fisher at <a href="mailto:jarrad@sanmateoRCD.org">jarrad@sanmateoRCD.org</a>
Deadline for proposal submissions	2/20/2019 Must be received by 5pm (PST)  Bids should be sent via email to Jarrad Fisher at <a href="mailto:jarrad@sanmateoRCD.org">jarrad@sanmateoRCD.org</a>  Note that the file size limit is 10MB. (Multiple emails are acceptable if necessary)  If unable to submit via email, a hard copy of the bid should be mailed to or dropped off the following address: San Mateo RCD Attn: Jarrad Fisher 80 Stone Pine Rd, Suite 100 Half Moon Bay, CA 94019
RCD & County Board Approval of Award	TBD
Notification of Award	TBD



Contract Date	TBD
Mobilization and Construction Work Start	TBD (Mobilization) TBD (Construction)
Work Completion Date	4/15/2019

## **8. Prevailing Wage Laws and Labor Compliance Program (Exhibit F)**

This project is subject to prevailing wage requirements and a labor compliance program will be established by the RCD using a third-party consultant to oversee contractor compliance.

Eligibility requirements for bidding contractors for prevailing wage projects include:

- Be in good legal standing with no outstanding judgments or liens owed to workers or to the State of California.
- Not be [debarred from doing public works](#) by the United States Department of Labor or any state that has public works debarment laws.
- Have a California Contractors State License if one is required (non-construction contractors must provide their professional license number if one exists for their profession).

## **9. Registration Pursuant to Labor Code Section 1725.5**

All contractors and subcontractors who will perform any portion of the work must be currently registered and qualified to perform public work pursuant to Labor Code Section 1725.5. Bids submitted by contractors, or including subcontractors, who are not registered will be rejected.

## **10. Permits**

The RCD will be responsible for obtaining CEQA and San Mateo County encroachment permit. Copies of all permits will be provided to the Contractor, and one copy of each permit must be kept at the job site at all times.

## **11. Inspections**

All work performed on this project shall be subject to regular inspections. The Contractor shall not cover up any work prior to these inspections. It is the Contractor's responsibility to contact the Project Manager to conduct required inspections. Inspections shall occur during construction and at job completion.

## **12. Sensitive Areas**

The project site is an environmentally sensitive area. Contractor shall take all precautions and measures necessary to protect the environmental integrity of the site, including but not limited to the protection of all plants, animals, and aquatic life.

## **13. Licenses**

To submit a bid on this contract, a valid Contractor's License issued by the Contractor's State License Board is required.

## **14. Safety Plan**

A written safety plan shall be submitted to RCD by the successful bidder prior to the start of construction activities.

## **15. Evaluation of Bids**

The RCD will accept the proposal which is of the greatest advantage to the project and the RCD. RCD has the right to reject any and all proposals and add alternates. **RCD is not required to accept the low bid.**

## **16. Contract and Payment**

A lump sum contract will be awarded to the successful bidder for all work described in Exhibit A. Submission of invoice for lump sum payment to the Contractor may be made following completion of work and final inspection, or progress invoices may be submitted for payment for completed work in accordance with the provisions described in 5 of the attached sample contract (Exhibit C). Payment policy and instructions for vendors are attached hereto as Exhibit G: Billing Instructions for Contractors.

## **17. Bonds**

The Contractor shall provide a performance bond in favor of the RCD in the amount of one hundred percent (100%) of the contract price and a payment bond in favor of the RCD in the amount of fifty percent (50%) of the contract price.

Contractor will provide signed copies of the following before commencement of the work:

- Material and Labor Payment Bond
- Performance Bond
- Certificate of Compliance (Exhibit E)

**EXHIBIT A**  
**Project Plans and Specifications and Reports**  
Huckleberry Flat Pipeline Project at Memorial County Park



# MEMORIAL PARK WATER LINE REPLACEMENT (HUCKLEBERRY)

[illegible]

DESIGNED BY:	DATE:	
DWN BY:	SOLICITATION NO.:	
SUBMITTED BY:	CONTRACT NO.:	
FOR REDUCED PLANS ORIGINAL SCALE INCHES		
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**TITLE SHEET**  
MEMORIAL PARK  
WATER LINE REPLACEMENT  
(HUCKLEBERRY)  
9500 PESCADERO CREEK ROAD  
LOMA MAR, CA 95020

SHEET  
IDENTIFICATION

**G-1**

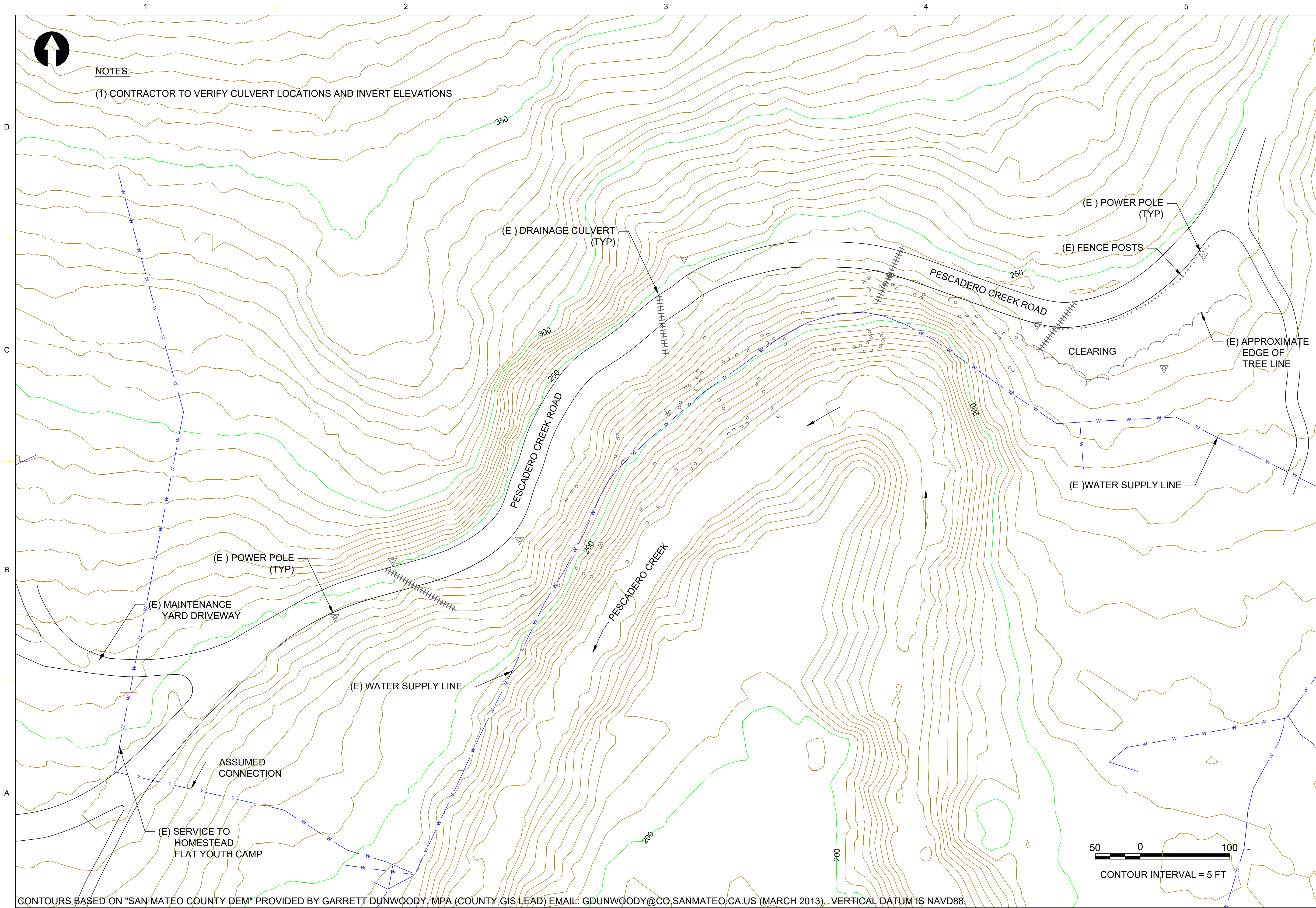
SHEET 1 OF 8



**Project Overview:** The purpose of this project is to upgrade an existing water distribution line that is currently exposed and vulnerable to failure with a new 4-inch HDPE water line. The new HDPE line will be connected to the existing water distribution lines at the Huckleberry Flat Picnic Area and at the entry driveway to the Maintenance Yard.







NOTES:

(1) CONTRACTOR TO VERIFY CULVERT LOCATIONS AND INVERT ELEVATIONS

MARK	DESCRIPTION	DATE	APPR.
1	CONSTRUCTION DRAWING SET	11/06/2018	RS



DESIGNED BY:	DATE:	SOLICITATION NO.:	CONTRACT NO.:
DWN BY:	CHK BY:	SUBMITTED BY:	

FOR REDUCED PLANS ORIGINAL SCALE INCHES

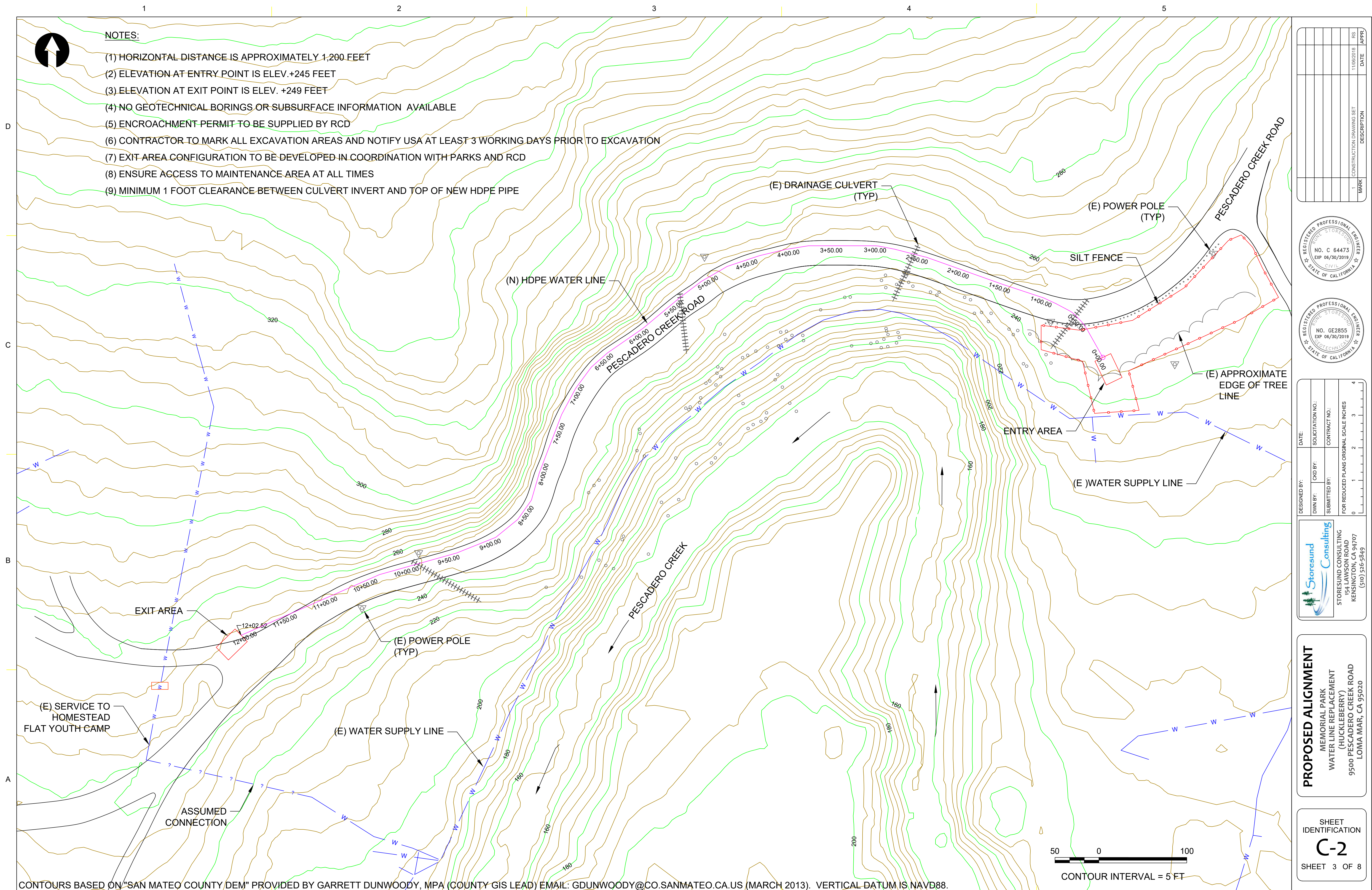
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**Storesund Consulting**  
STORESUND CONSULTING  
154 LAWSON ROAD  
KENSINGTON, CA 94707  
(510) 526-5849

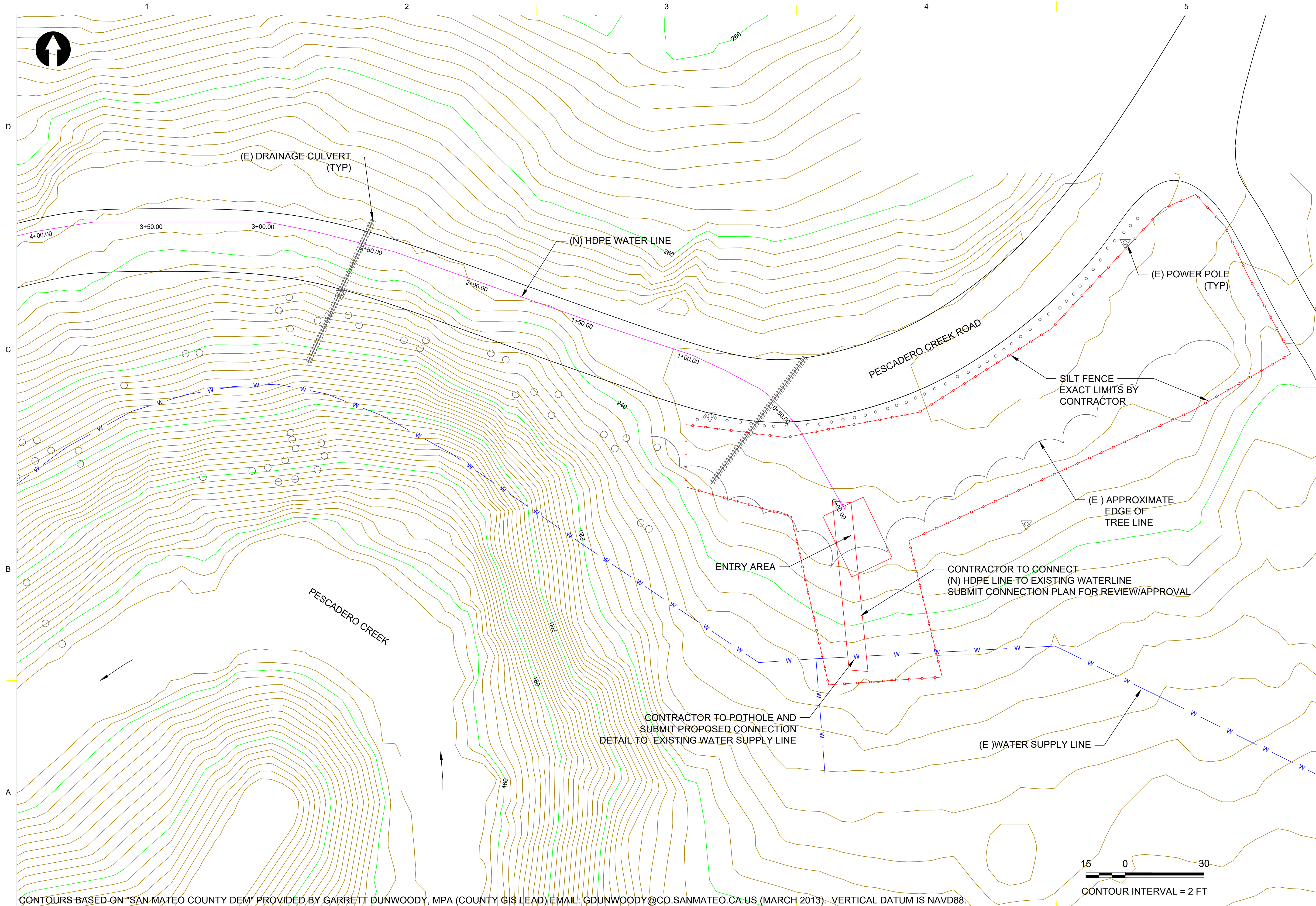
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MEMORIAL PARK  
WATER LINE REPLACEMENT  
(HUCKLEBERRY)  
9500 PESCADERO CREEK ROAD  
LOMA MAR, CA 95020

SHEET IDENTIFICATION  
**C-1**  
SHEET 2 OF 8









CONTOURS BASED ON "SAN MATEO COUNTY DEM" PROVIDED BY GARRETT DUNWOODY, MPA (COUNTY GIS LEAD) EMAIL: GDUNWOODY@CO.SANMATEO.CA.US (MARCH 2013). VERTICAL DATUM IS NAVD88.

MARK	DESCRIPTION	DATE	APPR
1	CONSTRUCTION DRAWING SET	11/06/2018	RS



DESIGNED BY:	DATE:	SOLICITATION NO.:	CONTRACT NO.:
DWN BY:	CKO BY:	SUBMITTED BY:	

FOR REDUCED PLANS ORIGINAL SCALE INCHES

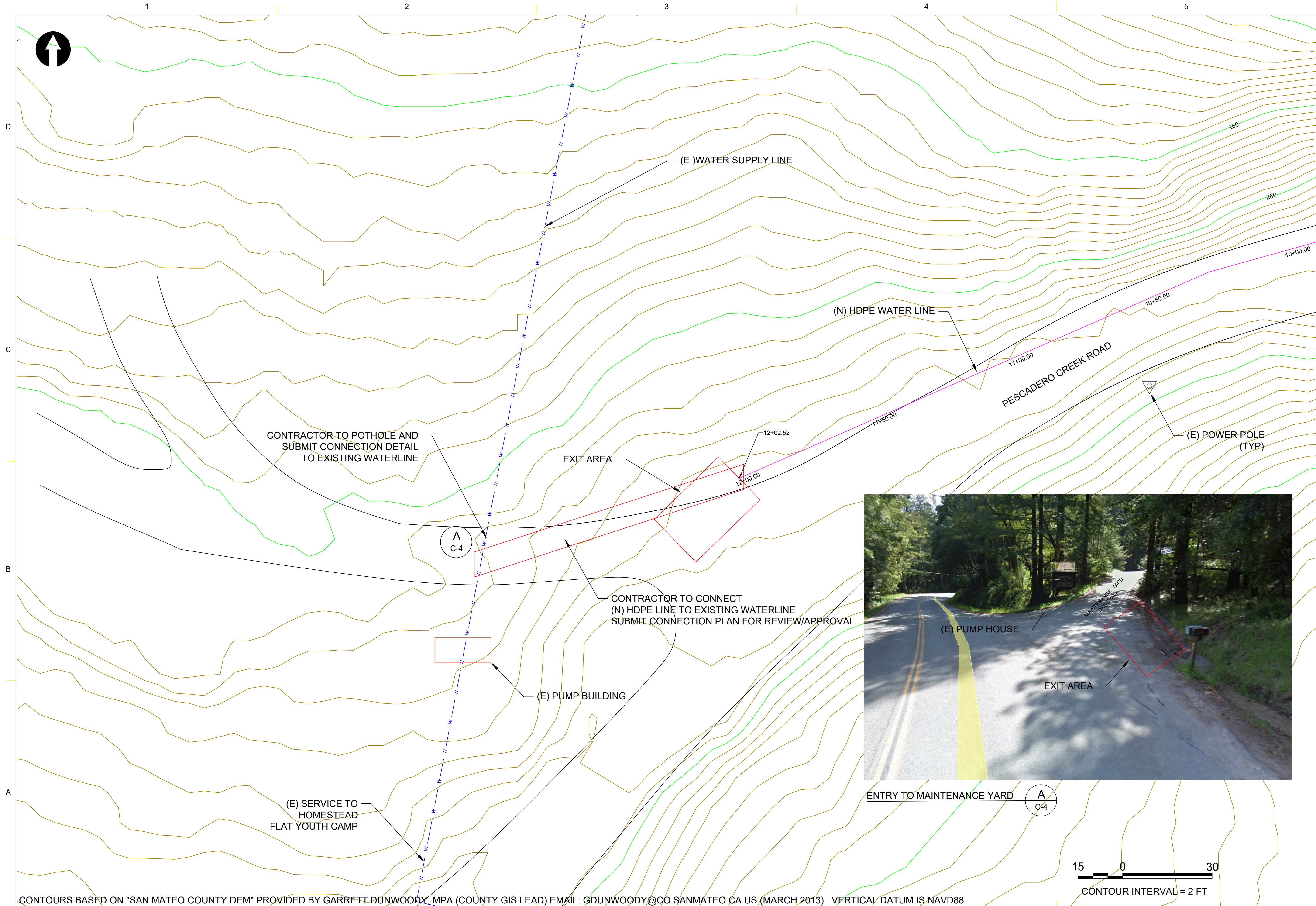
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**Storesund Consulting**  
STORESUND CONSULTING  
154 LAWSON ROAD  
KENSINGTON, CA 94707  
(510) 526-5849

**ENTRY LOCATION**  
MEMORIAL PARK  
WATER LINE REPLACEMENT  
(HUCKLEBERRY)  
9500 PESCADERO CREEK ROAD  
LOMA MAR, CA 95020

SHEET IDENTIFICATION  
**C-3**  
SHEET 4 OF 8





MARK	DESCRIPTION	DATE	APPR.
1	CONSTRUCTION DRAWING SET	11/06/2018	RS



DESIGNED BY:		DATE:			
DWN BY:	CKD BY:	SOLICITATION NO.:			
SUBMITTED BY:		CONTRACT NO.:			
FOR REDUCED PLANS ORIGINAL SCALE INCHES					
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**Storesund Consulting**  
STORESUND CONSULTING  
154 LAWSON ROAD  
KENSINGTON, CA 94707  
(510) 526-5849

**EXIT LOCATION**  
MEMORIAL PARK  
WATER LINE REPLACEMENT  
(HUCKLEBERRY)  
9500 PESCADERO CREEK ROAD  
LOMA MAR, CA 95020

SHEET IDENTIFICATION  
**C-4**  
SHEET 5 OF 8





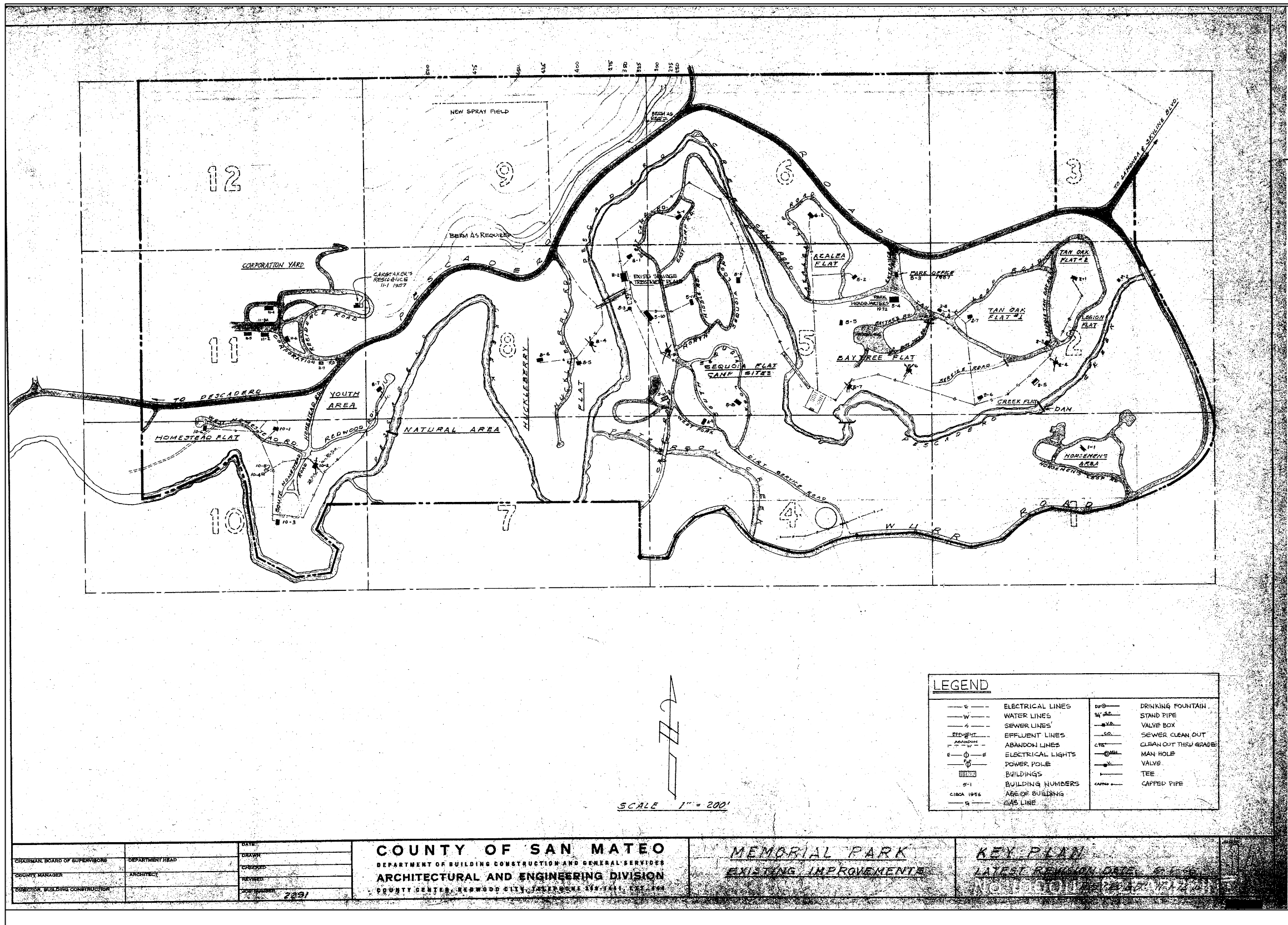






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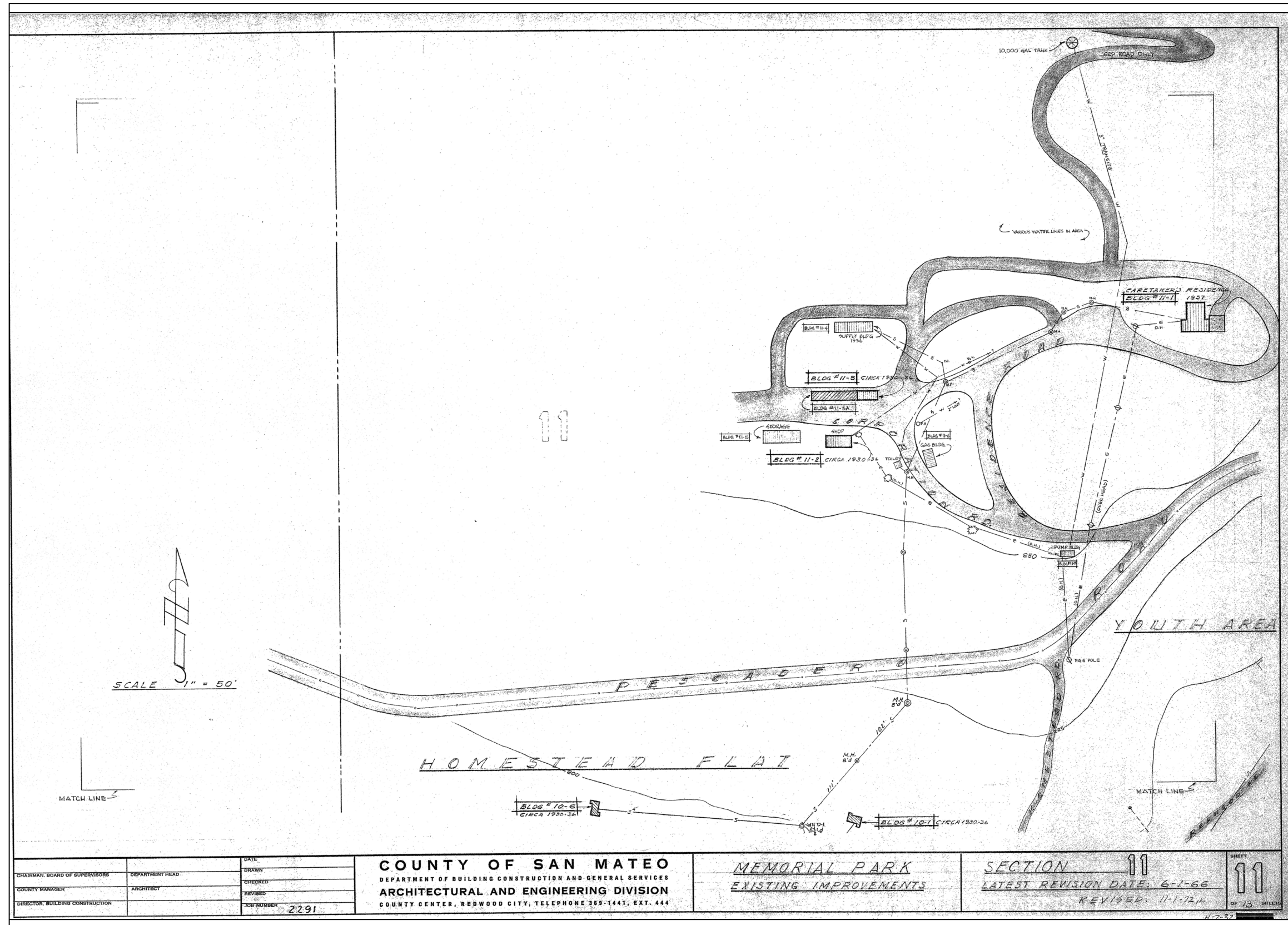
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A

C-7

B

A



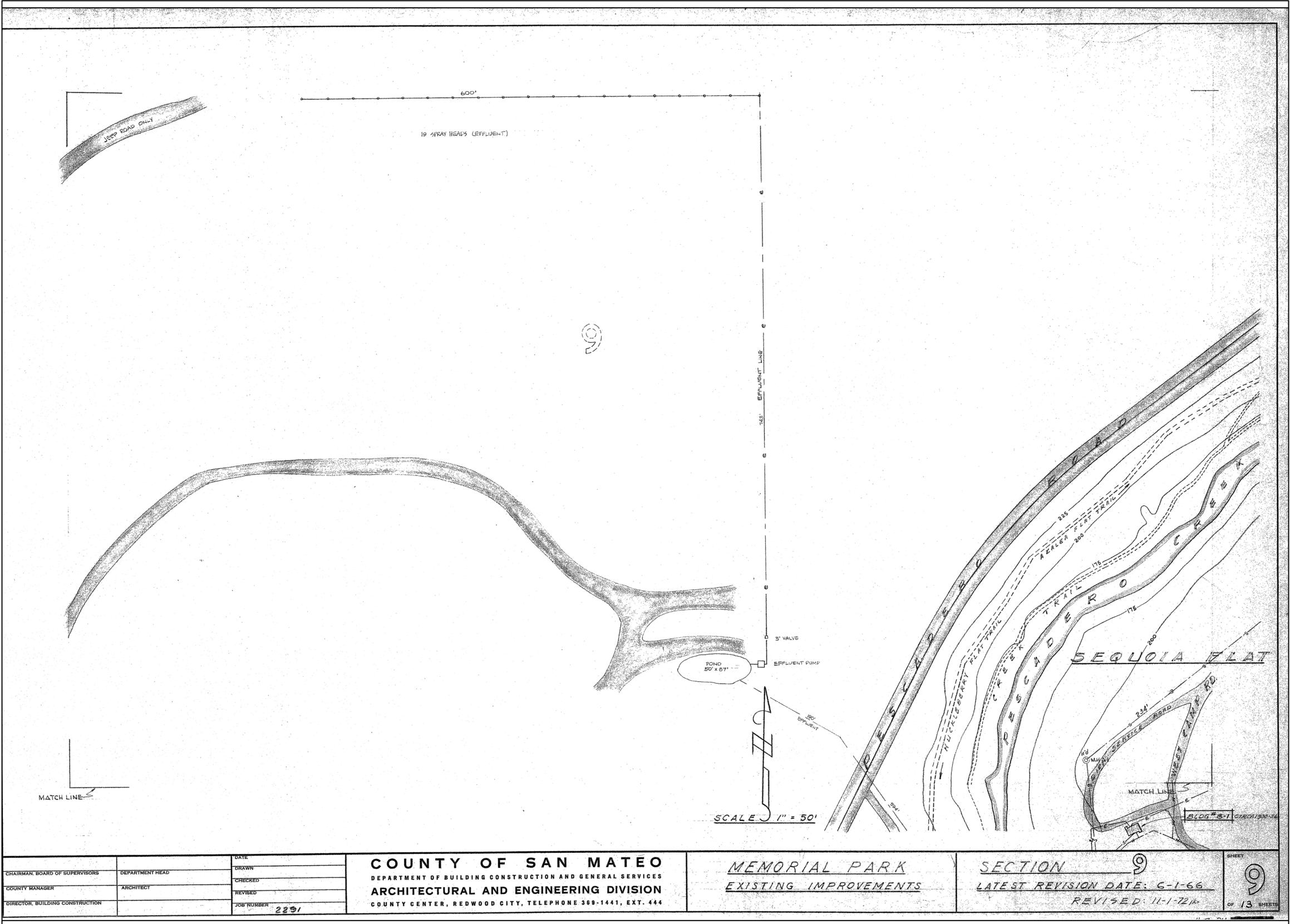
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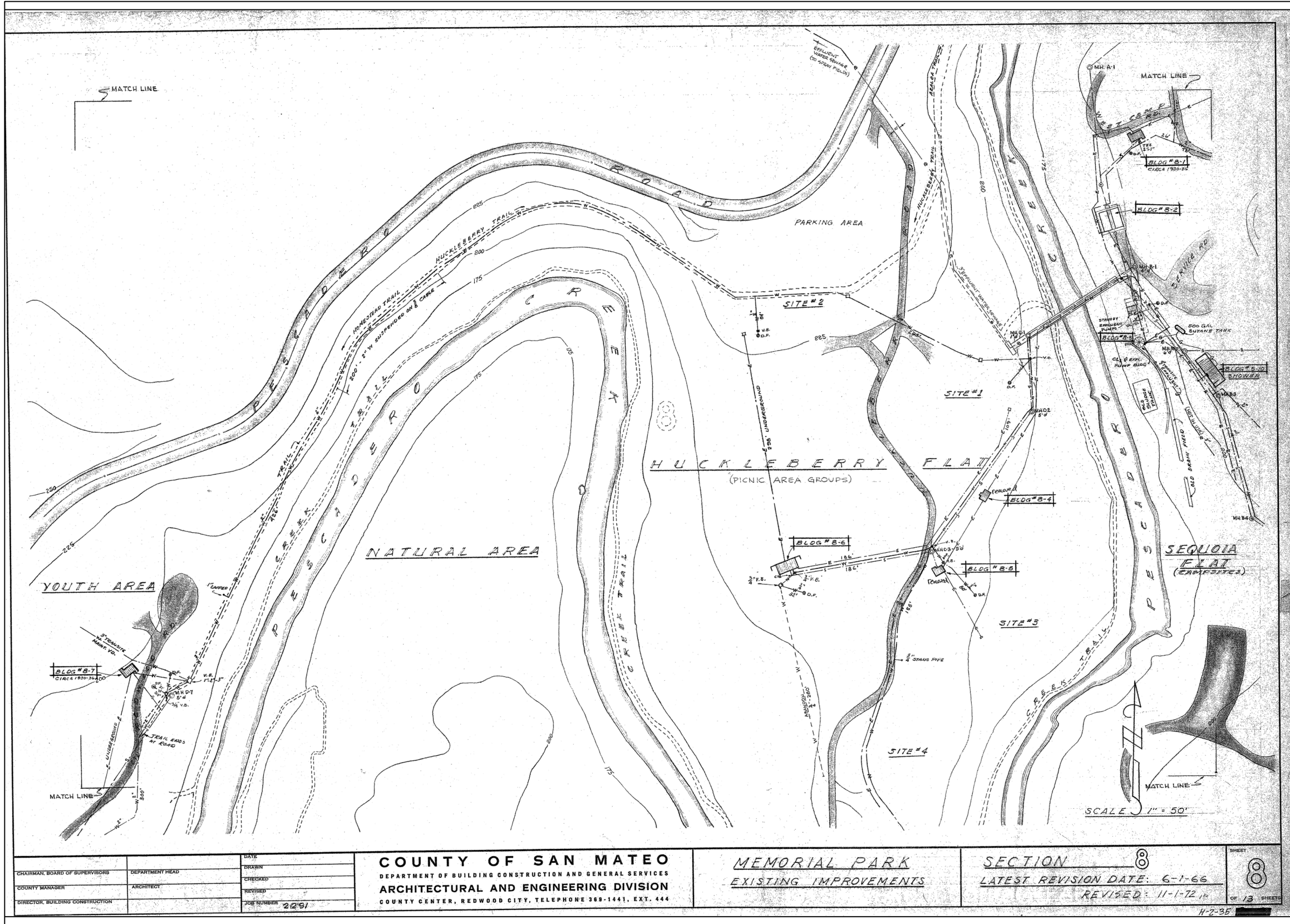
C-7

D

C-7



HISTORIC WATER LINE LAYOUT -09  
SCALE: AS SHOWN



HISTORIC WATER LINE LAYOUT -08  
SCALE: AS SHOWN

C

C-7

MARK	DESCRIPTION	DATE	APPR.
1	CONSTRUCTION DRAWING SET	11/06/2018	RS



DESIGNED BY:		DATE:			
DWN BY:	CKD BY:	SOLICITATION NO.:			
SUBMITTED BY:		CONTRACT NO.:			
FOR REDUCED PLANS ORIGINAL SCALE INCHES					
0 1 2 3 4					

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KENSINGTON, CA 94707  
(510) 526-5849

**EXISTING INFORMATION**  
MEMORIAL PARK  
WATER LINE REPLACEMENT  
(HUCKLEBERRY)  
9500 PESCADERO CREEK ROAD  
LOMA MAR, CA 95020

SHEET IDENTIFICATION  
**C-7**  
SHEET 8 OF 8



**SPECIFICATIONS &  
SPECIAL PROVISIONS  
FOR**

**MEMORIAL PARK WATER REPLACEMENT LINE  
HUCKLEBERRY SEGMENT  
LOMA MAR AREA**

**WITH APPURTENANT WORK THERETO  
IN SAN MATEO COUNTY**

APPROVED: \_\_\_\_\_, 2018

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RUNE STORESUND, D.ENG., PE, GE  
(R.C.E. No. 64473)  
Consulting ENGINEER

\*\*\*\*\*

Storesund Consulting  
154 Lawson Road  
Kensington, California 94707



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Note: Gaps in Section numbering, above, indicate that the Section is either blank or does not apply.

**APPENDIX A**

Daily Personnel and Equipment Log

**SECTION 1.**  
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**END OF SECTION**

**SECTION 2.**  
**PROPOSAL REQUIREMENTS AND CONDITIONS**  
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2-1. Plans and Specifications

Subject to the exceptions stated herein, the work embraced herein shall be done in accordance with the Standard Plans and Specifications as adopted by the County of San Mateo insofar as the same may apply, and in accordance with the following Special Provisions.

As set forth in **Resolution No. 068389** of the Board of Supervisors of the County of San Mateo, adopted **November 14, 2006**, which approved the Standard Plans and Standard Specifications, dated **May 2006**, of the State of California, Department of Transportation as the Standard Plans and Standard Specifications of the County of San Mateo, State of California.

In the event that a discrepancy arises between the project Plans, these Special Provisions, the Standard Plans and the Standard Specifications, the provisions of the second paragraph of Section 5-1.04, "Coordination and interpretation of Plans, Standard Specifications, and Special Provisions," of the Standard Specifications shall apply.

**END OF SECTION**

**SECTION 3.**

**BLANK**

**END SECTION**

**SECTION 4.**  
**DESCRIPTION OF WORK**

The work to be done consists, in general; installing 4" water main including trench and backfill, water line connections to any water service that was impacted by the waterline improvement, water valves, elbows, thrust blocks, fittings, as well as any other items and details not mentioned above, but required by the Project Plans, Standard Specifications and these Special Provisions, and the directions of the ENGINEER.

**END OF SECTION**

## SECTION 5. CONTROL OF WORK

Attention is directed to the provisions of Section 5, "Control of Work," of the Standard Specifications, except as herein provided, and to Section 2-1, "Plans and Specifications," of these Special Provisions.

### 5-1. Differing Site Conditions

This section shall be used in lieu of Section 5-1.116, "Differing Site Conditions," of the Standard Specifications. Section 5-1.116 of the Standard Specifications shall not apply.

There are no geotechnical borings or other subsurface information available for the proposed alignment. CONTRACTOR shall be solely responsible for assuming subsurface conditions. No differing site conditions will be granted for subsurface hardness conditions (soil, weathered rock, hard rock).

The following shall apply to digging trenches or other excavations that extend deeper than four feet (4') below the surface:

- A. The CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the ENGINEER, in writing, of any:
  - (1) Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code, that is required to be removed to a Class I, II, or III disposal site in accordance with provisions of existing law.
  - (2) Subsurface or latent physical conditions at the site differing from those indicated.
  - (3) Unknown physical conditions at the site of any unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.
- B. The ENGINEER shall promptly investigate the conditions, and if he finds that the conditions do materially differ, or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR's cost of, or the time required for, performance of any part of the work, shall issue a change order, excluding loss of anticipated profits, under the procedures described in the contract. No contract adjustment that results in a benefit to the CONTRACTOR will be allowed unless the CONTRACTOR has provided the required written notice.



- C. In the event that a dispute arises between the ENGINEER and the CONTRACTOR whether the conditions materially differ, or involve hazardous waste, or cause a decrease or increase in the CONTRACTOR's cost of, or time required for, performance of any part of the work, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with all work to be performed under the contract. The CONTRACTOR shall retain any and all rights provided either by contract or by law that pertain to the resolution of disputes and protests between the contracting parties.
- D. In the event conditions materially differ from those indicated, the CONTRACTOR shall have no claim for construction delays, unless said conditions are determined by the ENGINEER to impact the controlling item of work.

**END OF SECTION**

## SECTION 6.

### CONTROL OF MATERIALS

Attention is directed to Section 6, “Control of Materials,” of the Standard Specifications and these Special Provisions.

The CONTRACTOR shall furnish all materials required to complete the work under this Contract.

6-1. Certificates of Compliance

Certificates of Compliance, conforming to the provisions in Section 6-1.07, “Certificates of Compliance,” of the Standard Specifications shall be furnished for all manufactured products, unless otherwise waived by the ENGINEER.

6-2. Materials Testing

Whenever the specifications require compliance with specified values for the following properties, tests will be made as indicated:

<b>Material To Be Tested</b>	<b>Property Being Tested For</b>	<b>Acceptable Test Method(s)</b>	<b>Description</b>
Trench Backfill	Relative Compaction	ASTM D1557, D6938, D 4254	Determines field densities using a nuclear gage.
Aggregate Base	Relative Compaction	CT 231 or ASTM D6938	Determines field densities using a nuclear gage.
Asphalt Concrete	Relative Compaction	CT 375 or ASTM D2950	Determines field densities using a nuclear gage.

Any costs to the RCD/DEPARTMENT for testing layers which fail the compaction requirements may be deducted from any progress payment due to the CONTRACTOR when, in the opinion of the ENGINEER, such failure results from the CONTRACTOR's lack of diligence in pursuing compaction effort. All testing shall be at the CONTRACTOR's expense.

**END OF SECTION**

## **SECTION 7.**

### **LEGAL RELATIONS AND RESPONSIBILITY**

**7-2. Repair of Equipment**

Attention is directed to the provisions of Section 7-1.21, “Repair of Equipment,” of the Standard Specifications.

**7-6. Highway Construction Equipment**

Attention is directed to Section 7-1.01D, “Vehicle Code,” of the Standard Specifications and these Special Provisions.

Pursuant to the authority contained in Section 591 of the Vehicle Code, the RCD has determined that, within such areas as are within the limits of the project and are open to public traffic, the CONTRACTOR shall comply with all the requirements set forth in Divisions 11, 12, 13, 14 and 15 of the Vehicle Code. Attention is directed to the statement in Section 591 that this section shall not relieve him or any person from the duty of exercising due care. The CONTRACTOR shall take all necessary precautions for safe operation of his equipment and the protection of the public from injury and damage from such equipment.

**7-7. Project Appearance**

The CONTRACTOR shall maintain a neat appearance to the work. Full compensation for conforming to the provisions in this section, not otherwise provided for, shall be considered as included in the unit prices paid for the various Contract items of work involved, and no additional compensation will be allowed therefor.

**7-8. Preservation of Property**

The CONTRACTOR's attention is directed to Section 7-1.11, “Preservation of Property,” and Section 8-1.10, “Utility and Non-Highway Facilities,” of the Standard Specifications.

**7-9. Air Pollution Control**

Air pollution control shall conform to the provisions of Section 7-1.01F, “Air Pollution Control,” of the Standard Specifications.

**7-10. Obstructions**

Attention is directed to the provisions in Sections 8-1.10, “Utility and Non-Highway Facilities,” 15, “Existing Highway Facilities,” and 51-1.19, “Utility Facilities,” of the Standard Specifications.

**7-11. Sound Control**

Sound control shall conform to the provisions in Section 7-1.01I, “Sound Control Requirements,” of the Standard Specifications.

7-12. Public Convenience

Public Convenience shall conform to the provisions in Section 7-1.08, “Public Convenience,” of the Standard Specifications and to these Special Provisions. The first sentence of the 15<sup>th</sup> paragraph of Section 7-1.08 is amended to read as follows:

“After the surface of the roadbed has been brought to a smooth and even condition for the passage of public traffic, as above provided, any work ordered by the ENGINEER for the accommodation of public traffic prior to commencing subgrade operations shall be at the CONTRACTOR’s expense.”

7-13. Public Safety

Public Safety shall conform to the provisions in Section 7-1.09, “Public Safety,” of the Standard Specifications and to these Special Provisions.

Full compensation for conforming to the requirements of this section shall be considered as included in the unit prices paid for the various Contract items of work, and no additional compensation will be allowed therefor.

7-14. Trench Safety

Trench Safety shall conform to the provisions in Section 5-1.02A, “Excavation Safety Plans,” and Section 7-1.01E, “Trench Safety,” of the Standard Specifications and these Special Provisions.

Full compensation for conforming to the requirements of this section shall be considered as included in the unit prices paid for the various Contract items of work, and no additional compensation will be allowed therefor.

7-15. Disposal of Material Outside the Highway Right Of Way

Disposal of Material Outside the Highway Right Of Way shall conform to the provisions of Section 7-1.13, “Disposal of Material Outside the Highway Right Of Way,” of the Standard Specifications, and Section 10, “Construction Waste Management,” of these Special Provisions.

**END OF SECTION**

**SECTION 8.**  
**BLANK**  
**END OF SECTION**

**SECTION 9.**  
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**END OF SECTION**

**SECTION 10.**

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**END OF SECTION**



**SECTION 11.**  
**MOBILIZATION**

Mobilization shall conform to the provisions in Section 11, "Mobilization," of the Standard Specifications and to these Special Provisions.

The contract lump sum price paid for “**Mobilization**” shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in mobilizing labor, materials and equipment for a timely start and efficient completion of all work, complete in place, including contacting USA North (1-800-227-2600), as specified in the Standard Specification, and these Special Provisions, and as directed by the ENGINEER.

**END OF SECTION**

## SECTION 12.

### MAINTAINING TRAFFIC

Attention is directed to Sections 4-1.04, “Detours,” 7-1.08, “Public Convenience,” 7-1.09, “Public Safety,” and 12-2.02, “Flagging Costs,” of the Standard Specifications, these Special Provisions, the Standard Plans, the Project Plans and the directions of the ENGINEER. The first paragraph of Section 12-2.02, “Flagging Costs,” shall not apply. In connection with said sections, it is understood that all lights, signs, barricades, flaggers or other necessary devices shall be furnished and maintained by the CONTRACTOR at the CONTRACTOR's expense.

Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners. Convenient access to cross streets, driveways, houses and buildings along the line of work shall be maintained. Existing roadway surfaces within the project limits shall remain, except as required for subsurface work, until removal is necessary for construction of the roadway structural section. In this regard, general roadway excavation shall not commence until authorized by the ENGINEER.

The CONTRACTOR shall furnish an overall Traffic Control Plan for all phases of work. The Plan shall be in accordance with Standard Plan T-13 (Page 222) unless these requirements are modified as directed by the ENGINEER. The CONTRACTOR shall submit the Traffic Control Plan within FIVE (5) WORKING DAYS after the pre-construction conference. The ENGINEER shall establish the time and place for said pre-construction conference. Delays upon the part of the CONTRACTOR in submitting a Plan, in the format as outlined in these Special Provisions and as directed by the ENGINEER, shall not constitute a valid reason for time extensions should the Contract time elapse before completion of said project. The CONTRACTOR is further advised that consideration for adequate review time, as determined by the ENGINEER, shall be included in the work schedule.

The Traffic Control Plan shall include orange advisory signs, **3' x 6' minimum**, stating expected delays, road closures, including dates, times and affected streets. Wording of advisory signs shall be as follows:

**COUNTY OF SAN MATEO**  
**Memorial Park Water Replacement Line – Huckleberry Segment**  
**“IDENTIFY AREA TO BE CLOSED”**  
**FROM DATE TO DATE**

Signs shall be set in place a minimum of **SEVEN (7) CALENDAR DAYS** prior to commencement of construction site work, unless otherwise directed by the ENGINEER. No construction site work shall commence prior to the ENGINEER's approval of the Traffic Control Plan and installation of required signs. **The CONTRACTOR is advised that the roads within the project limits may be closed for certain construction operations. The CONTRACTOR's attention is directed to Section 8-3, “Progress Schedule,” of these Special Provisions.**

**Hand written signs will not be permitted.**

Proposals by the CONTRACTOR to close portions of roadways within the Project limits to through traffic during and/or outside of working hours shall be submitted, as a part of the Traffic Control Plan, to the ENGINEER for review. Acceptance of such proposals shall be entirely at the discretion of the ENGINEER. Should the ENGINEER reject the CONTRACTOR's road closure proposals, the CONTRACTOR shall be required to adhere to the provisions herein relating to passage of public traffic through the work and maintenance of traffic lanes through the work.

If any component in the traffic control system is damaged, displaced or ceases to operate or function as specified, from any cause, during the progress of the work, the CONTRACTOR shall immediately repair or replace said component to its original condition and reinstall the component to its original location.

The provisions in this Special Provision will not relieve the CONTRACTOR from responsibility to provide additional devices or take such measures as may be necessary to comply with the provisions in Section 7-1.09, “Public Safety,” of the Standard Specifications.

At locations where traffic is being routed through construction under one-way controls, the movement of the CONTRACTOR's equipment from one portion of work to another shall be governed in accordance with such one-way controls.

During paving and striping operations, the CONTRACTOR shall furnish and place sufficient barricades and detour signs at all cross streets to protect new pavement surfaces and markings. The duration of placement of said barricades shall be as approved by the ENGINEER.

Whenever the CONTRACTOR's operations create a condition hazardous to traffic or to

the public, the CONTRACTOR shall take the necessary precautions and provide additional traffic control measures to protect those who must pass through the work. If the CONTRACTOR shall appear to be neglectful or negligent in providing warning or protective measures, the ENGINEER may direct attention to the existence of a hazard, and require that additional barricades, flashers, warning and detour signs or lights be installed by the CONTRACTOR, or additional flaggers provided. Any action or lack of action by the ENGINEER as provided herein shall not relieve the CONTRACTOR from responsibility for public safety.

The Contract lump sum price paid for this item, "Maintaining Traffic," shall include full compensation for furnishing a complete Traffic Control Plan, for providing all labor (including flagging costs), materials (including all stationary and portable signs, lights, traffic cones, and lane delineators), tools, equipment and incidentals, and for doing all the work involved in placing, removing, storing, maintaining, moving to new locations, replacing, and disposing of the components of the traffic control system as shown on the Plans, the approved Traffic Control Plan, and the Standard Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the ENGINEER, and no additional compensation shall be allowed therefor.

## **END OF SECTION**

## **SECTION 15.**

### **EXISTING HIGHWAY FACILITIES**

The work performed in connection with various existing highway facilities shall conform to the provisions in Section 15, "Existing Highway Facilities", of the Standard Specifications, Sections 7-14, "Trench Safety," and 15, "Existing Highway Facilities," of these Special Provisions, Appendix B of these Project specifications, the Plans, and the directions of the ENGINEER.

The CONTRACTOR shall be responsible for locating existing utilities before proceeding with waterline and water treatment facilities work to avoid unnecessary breakage of the existing underground utilities to remain. Said potholing shall be completed prior to utility trenching.

Facilities not designated on the Plans or by the ENGINEER for removal shall remain in place. Damage to these facilities as a result of the CONTRACTOR's operations, as determined by the ENGINEER, shall be repaired by the CONTRACTOR, all at the expense of the CONTRACTOR and to the satisfaction of the ENGINEER, and no additional compensation will be allowed for therefor.

**The CONTRACTOR shall call USA North at (800) 227-2600 a minimum of two (2) working days in advance of any excavation or trenching work.**

Full compensation for doing all work conforming to the requirements of this section shall be considered as included in the contract price paid for the various Contract items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**

## **SECTION 16.**

### **CLEARING AND GRUBBING**

Clearing and grubbing shall conform to the provisions of Sections 15, “Existing Highway Facilities,” and 16, “Clearing and Grubbing,” of the Standard Specifications, these Special Provisions, the Plans and the directions of the ENGINEER.

**The CONTRACTOR attention is directed to Sub-section 10-2, “References and Resources,” of Section 10, “Construction Waste Management,” of these Special Provisions.**

Areas within the limits of work, as shown on the Plans, or as directed by the ENGINEER, shall be cleared as necessary for the construction of improvements and related work. The areas to be cleared and grubbed will not necessarily extend to all right-of-way lines. The exact limits for clearing and grubbing shall be approved by the ENGINEER in advance of commencing any work.

No existing trees and shrubs within the limits of work shall be removed, unless otherwise directed by the ENGINEER

Removal of any asphalt concrete improvements shall be as shown on the Plans and as directed by the ENGINEER.

**The CONTRACTOR shall not remove fences, trees, shrubs, hedges or any other landscaping or improvements prior to receiving written approval from ENGINEER.**

Concrete removal shall conform to the provisions of Section 15, “Existing Highway Facilities,” of the Standard Specifications and these Special Provisions and shall be removed as shown on the Plans and as directed by the ENGINEER.

All materials removed shall become the property of the CONTRACTOR and shall be disposed of in accordance with Section 7-15, “Disposal of Material Outside the Highway Right of Way,” of these Special Provisions.

Nothing herein shall be construed as relieving the CONTRACTOR of his responsibility for final cleanup of the highway, as provided in Section 4-1.02, “Final Cleaning Up,” of the Standard Specifications.

Full compensation for doing all the work involved in Clearing and Grubbing including but not limited to clearing and grubbing, structure backfill, the removal and disposal of concrete at locations shown on plans, disposal of materials resulting from clearing and grubbing activities shall be considered as included in contract price paid for various items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**

## **SECTION 20.**

### **EROSION AND SEDIMENT CONTROL**

**The provisions of Section 20, “Erosion Control and Highway Planting,” of the Standard Specifications are superseded by these Special Provisions.**

The CONTRACTOR is advised that failure to fully comply with the provisions of this Section and/or Section 101 “Water Pollution Control,” of these Special Provisions, and all requirements listed in the National Pollutant Discharge Elimination System (NPDES) General Permit, San Francisco Bay Region Municipal Regional Stormwater NPDES Permit, and any resource agency permits obtained for the project, where applicable, except where amended in writing and signed by the RCD or his duly authorized representative, shall constitute substantial non-compliance with the requirements of the Clean Water Act, the NPDES permit program, and the Contract.

The RCD shall provide periodic site monitoring to ensure that the work complies with the requirements specified herein and in any resource agency permits. The RCD will provide the CONTRACTOR with copies of the monitoring reports. Should the work be found to be non-compliant, a follow up site monitoring visit will be conducted to ensure the items have been corrected. The costs associated with any compliance monitoring required beyond a single follow up site monitoring visit shall be deducted from the final payment for all of the Contract work.

#### **20-1. Temporary Silt Fence**

No excavation or backfill work shall commence until temporary silt fence has been placed as shown on the plans and as directed by the ENGINEER.

Temporary silt fence shall be installed on contour a minimum of two (2) feet to the downslope side of any excavation or backfill. Temporary silt fence shall be installed as shown on the Plans, with the supporting posts on the downslope side of the fence structure. Silt fence lines shall be unbroken, with silt fencing pieces wound together to form a contiguous structure as shown on the Plans. Attention is directed to Section 20-2, “Temporary Erosion Control,” of these Special Provisions for additional requirements.

The ENGINEER may deem it necessary and require parallel silt fencing to contain the full limits of excavation and backfill. Parallel silt fence shall be placed on contour and shall overlap the horizontal projection of the primary silt fence by not less than eight (8) linear feet.

No silt fencing shall be placed in or across any flowing stream.

#### **Inspection and Maintenance**



Silt fencing shall be inspected and any necessary repairs made by the CONTRACTOR at his expense daily prior to any excavation or backfill. The CONTRACTOR shall remove any soil, rock and/or debris contained by the silt fence once they have reached a depth of half (½) the above-ground height of the silt fence.

Any soil, rock and/or debris that are stockpiled shall be protected against wind, rainfall and runoff at all times. Plastic sheeting may be used to cover soils (including aggregate base), and shall be securely anchored by sandbags or other suitable means. At no time will any stockpiled materials be allowed to erode into any watercourse or onto any roadway or other tributary surface.

#### Removal and Disposal

Temporary silt fence and any soil, rock or debris shall be completely removed by the CONTRACTOR at the conclusion of the work. Temporary silt fence and any soils, rock or debris shall be disposed of outside the highway right of way in accordance with the provisions of Section 7-15, "Disposal of Material Outside the Highway Right-of-Way," of these Special Provisions, by the CONTRACTOR at his expense. Soil, rock or debris shall not be scattered or "flaked" on any slope. The CONTRACTOR shall specify in writing the method of removal and disposal for the ENGINEER's approval not less than two (2) working days prior to removing silt fence.

#### 20-2. Temporary Erosion Control

The CONTRACTOR shall be required to adhere to the provisions of Section 101 "Water Pollution Control," this Section, and the directions of the ENGINEER throughout the work.

Temporary erosion controls may consist of straw logs, straw mulch, silt fencing, temporary berms, redwood duff, or any combination of these or other means acceptable to the ENGINEER to prevent polluted runoff and/or wind erosion. The use of any type of hay or any straw containing oat or weed seed is expressly forbidden. The CONTRACTOR is encouraged to review the Best Management Practices (BMPs) included in the County of San Mateo Maintenance Standards for installation and maintenance recommendations.

Temporary erosion controls shall be applied, maintained and removed by the CONTRACTOR as specified herein and as directed by the ENGINEER. The CONTRACTOR shall not commence any excavation, backfilling, grading or stockpiling operations until sufficient quantities and types of temporary erosion control materials have been delivered to the work site as determined by the ENGINEER.

Additional temporary erosion controls, if necessary and as directed by the ENGINEER, shall be installed at the conclusion of the workweek to the satisfaction of the ENGINEER. The ENGINEER may also require the installation of temporary erosion controls at the conclusion of any work day when rain and/or wind is occurring or forecast.

The CONTRACTOR is advised that he may be required to respond to the work site after hours and/or on weekends or holidays to mitigate potential erosion or sedimentation and/or to repair damaged silt fencing and other erosion controls. Provisions for the CONTRACTOR's Required Response are included in Section 101 "Water Pollution Control," of these Special Provisions.

#### Staging Areas

The CONTRACTOR shall contain runoff that may potentially leave any staging area to within the staging area by any suitable means approved by the ENGINEER.

Staging area BMPs shall be maintained throughout the duration of the work. Staging area BMPs shall be completely removed and disposed of outside the highway right of way in accordance with the provisions of Section 7-15, "Disposal of Material Outside the Highway Right-of-Way" of these Special Provisions, by the CONTRACTOR at his expense at the conclusion of the work. Attention is directed to Section 101 "Water Pollution Control," of these Special Provisions for provisions relating to tracking of mud from staging areas.

#### Staging Area Finish

The CONTRACTOR shall finish all staging areas as specified herein and as directed by the ENGINEER.

All stockpiles, and debris shall be completely removed and disposed of outside the highway right of way by the CONTRACTOR at the conclusion of construction operations. Staging area surfaces shall be smoothed and contoured to drain in the same manner as prior to their use. Any adjacent areas disturbed by the CONTRACTOR's operations shall be smoothed and mulched as specified below.

Loose soil and/or rock resulting from any grading work required to restore the pre-construction condition shall not be scattered or "flaked" on any slope.

#### Payment

Full compensation for doing all the work involved in Erosion and Sediment Control, including furnishing, installing, moving, replacing, relocating and removing at end of the project of all Erosion and Sediment Pollution Control measures such as fiber

rolls, silt fence, temporary inlet drainage inlet protection, concrete washout, dewatering, sediment basins at locations shown on plans, including three separate submittal for the Sediment Control Plan for RCD review and approval & implementing best management practice as require per the NPDES constructing permit, shall be considered as included in contract price paid for various items of work, and no additional compensation will be allowed therefor.

The contract lump sum price paid for temporary erosion control shall include full compensation for furnishing all labor, material, tools, equipment and incidentals, and for performing all the work involved in temporary erosion control, including delivery of the materials to the site prior to excavation, backfill, grading or stockpiling work, certification, maintenance, removal, hauling and disposal outside the highway right of way, as shown on the plans and as directed by the ENGINEER, and no additional compensation will be allowed therefor.

#### **END OF SECTION**

**SECTION 39.**  
**ASPHALT CONCRETE (TYPE B)**

Asphalt concrete shall be Type B and shall conform to the provisions in Section 39, “Asphalt Concrete,” of the Standard Specifications and these Special Provisions.

The CONTRACTOR shall be responsible for locating and reference marking all existing highway facilities (such as manholes, valves, and monuments) within the Project limits prior to any paving work.

39-1. Asphalt Concrete (Type B, 1/2” Maximum, Medium Grading)

Asphalt concrete to be used for roadway area, including the conform areas, as shown on the Plans and as designated by the ENGINEER, shall be Type B, 1/2” Maximum, Medium grading.

Compacting shall be performed to achieve ninety-five percent (95%) of the maximum theoretical density. Sampling for acceptance testing shall be performed using California Test Method (CT) 375 or ASTM D2950 as directed by the ENGINEER.

If the CONTRACTOR does not achieve 95% compaction as specified herein, he shall be subject to reduced payment factors as summarized below:

**Reduced Payment Factors for Percent of Maximum Theoretical Density**

HMA Type A and B and RHMA-G Percent of Maximum Theoretical Density	Reduced Payment Factor	HMA Type A and B and RHMA-G Percent of Maximum Theoretical Density	Reduced Payment Factor
91.0	0.0000	97.0	0.0000
90.9	0.0125	97.1	0.0125
90.8	0.0250	97.2	0.0250
90.7	0.0375	97.3	0.0375
90.6	0.0500	97.4	0.0500
90.5	0.0625	97.5	0.0625
90.4	0.0750	97.6	0.0750
90.3	0.0875	97.7	0.0875
90.2	0.1000	97.8	0.1000
90.1	0.1125	97.9	0.1125
90.0	0.1250	98.0	0.1250
89.9	0.1375	98.1	0.1375
89.8	0.1500	98.2	0.1500
89.7	0.1625	98.3	0.1625
89.6	0.1750	98.4	0.1750
89.5	0.1875	98.5	0.1875
89.4	0.2000	98.6	0.2000
89.3	0.2125	98.7	0.2125
89.2	0.2250	98.8	0.2250
89.1	0.2375	98.9	0.2375
89.0	0.2500	99.0	0.2500
< 89.0	Remove and Replace	> 99.0	Remove and Replace

The amount of asphalt binder to be mixed with the aggregate shall be between four percent (4%) and six percent (6%) by weight of dry aggregate. The exact amount of asphaltic binder to be mixed with the aggregate shall be as determined by the ENGINEER.

Areas to which asphaltic emulsion has been applied shall be closed to public traffic. Care shall be taken to avoid tracking asphaltic emulsion onto existing pavement surfaces beyond the limits of construction.

The CONTRACTOR will be responsible for any damage to existing curbs, gutters, and driveways. Any asphalt concrete or asphaltic emulsion stains occurring during the course of this Contract will be cleaned by sandblasting, or any other method satisfactory to the ENGINEER. The cost of repairing this damage shall be considered as included in the contract prices paid for the various water system contract items of work,

and no separate payment will be allowed therefor.

At road conforms and driveway openings designated by the ENGINEER, additional asphalt concrete surfacing material shall be placed and hand raked, if necessary, and compacted to form smooth tapered connections. The CONTRACTOR is further advised that it will be his/her responsibility to ensure that the existing drainage patterns are to be maintained at all locations, as indicated on the Plans or as directed by the ENGINEER. Full compensation for furnishing all labor, tools, incidentals necessary for doing all work to hand rake said connections shall be considered as included in the Contract price paid per ton of asphalt concrete, and no additional compensation will be allowed therefore.

The CONTRACTOR's attention is directed to Paragraph 12 of Section 39-6.01, "General Requirements," of the Standard Specifications for spreading and compacting asphalt concrete:

"Longitudinal joints in the top layer shall correspond with the edges of proposed traffic lanes. Longitudinal joints in all layers shall be offset not less than 0.50 foot alternately each side of the edges of traffic lanes."

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals necessary for doing all work involved in installing asphalt concrete (Type B, 1/2" maximum, medium grading, as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the ENGINEER, shall be considered as included in the contract prices paid for the various water system contract items of work, and no separate payment will be allowed therefor.

39-2. Asphaltic Emulsion (Tack Coat)

Asphaltic Emulsion (Tack Coat) shall conform to the provisions of Section 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and Section 94, "Asphaltic Emulsions," of the Standard Specifications, these Special Provisions, and the directions of the ENGINEER.

39-3. Liquid Asphalt (Prime Coat)

Liquid asphalt shall conform to the provisions of Sections 39-4.02, "Prime Coat and Paint Binder (Tack Coat)," and 93, "Liquid Asphalts," of the Standard Specifications, and these Special Provisions.

Liquid asphalt shall be SC-70 or of the type designated by the ENGINEER and shall be placed at locations as shown on the Plans and as directed by the ENGINEER.

Full compensation for furnishing all labor, materials, tools, equipment, and incidentals necessary for doing all work involved in installing asphalt concrete (Type B, 1/2" maximum, medium grading, asphaltic emulsion (Tack Coat), and liquid asphalt (Prime Coat), as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the ENGINEER, shall be considered as included in the contract prices paid for the various water system contract items of work, and no separate payment will be allowed therefor.

**END OF SECTION**

## SECTION 80

### CHAIN LINK FENCE

In areas where existing chain link fence may be damaged, removed, or repaired, chain link fence shall be Type CL-6 and shall conform to the provisions of Section 80, "Fences," of the Standard Specifications, the Plans, these Special Provisions, and the directions of the ENGINEER.

The CONTRACTOR's attention is directed to Standard Plan A85. The CONTRACTOR shall provide new chain link fence materials, galvanized and coated in accordance with Sections 80-4.01A, "Posts and Braces," and 80-4.01B, "Fabric," of the Standard Specifications.

**For bidding purpose, use Caltrans standard plan A85, however new fence to match existing green vinyl coated fence in the field.**

A chain link fence shall be installed to secure the area to the satisfaction of the ENGINEER. The chain link fence shall be six feet (6') in height and shall be installed to the locations, and limits shown on the Plans, and as directed by the ENGINEER. Limits of the installation of chain link fence shall be to a point where said fence shall meet the existing six-foot (6') high chain link fence. It is anticipated that fence posts may be required to be set in existing boulders on the slope. This may require drilling a hole into the boulders of sufficient size to allow for placement of fence posts, to a depth of twelve inches (12") minimum. Trimming of chain link fence to accommodate its installation may be required. Individual fence segments shall be detachable from fence posts.

Concrete for post footings shall be Class 3 concrete, and shall be in accordance with Section 90, "Portland Cement Concrete" of the Standard Specifications.

Any surplus material from excavation of postholes shall become the property of the CONTRACTOR and shall be disposed of as provided in Section 7-15, "Disposal of Material Outside the Highway Right of Way," of these Special Provisions.

The CONTRACTOR is advised that the wire fabric for the chain link fence, Type CL-6, shall be fabricated, furnished, and installed as separate and removable panel segments, as shown on the Plans. The fabric panel segments shall be fitted with a type of post connection (slotted, ringed and bolted, etc.) and in a manner that allows disconnection of the fabric from the line post with the use of hand tools only. The type and method of panel segment post connection shall be approved, in writing, by the ENGINEER prior to ordering, fabrication, and acquisition of such material by the CONTRACTOR.



Chain link fence shall be measured by the linear foot from end post to end post of the completed chain link fencing. The point of measurement at each end post shall be the center of the metal post.

The Contract unit price paid per linear foot for this item, “Fences (6’ Green Vinyl Chain Link),” shall include full compensation for furnishing all labor, materials (including Class 3 concrete for fence post footings and barbed wire), tools, equipment, and incidentals necessary for doing all work involved in installing chain link fence, barbed wire, complete in place, including, but not limited to, excavation, backfill and disposal of surplus materials, set fence post footings, and trimming of fence mesh, if required, as shown on the Plans, as specified in the Standard Specifications and these Special Provisions, and as directed by the ENGINEER, and no additional compensation will be allowed therefor.

### **END OF SECTION**

## **SECTION 100.**

### **CONSTRUCTION STAKING AND LAYOUT**

The CONTRACTOR shall be responsible for all land surveying and shall provide construction stakes or marks necessary to establish the limits, lines, alignments, and grades required for proper construction staking layout and completion of the work as shown on the drawings, as specified in these Special Provisions, and as directed by the ENGINEER. All construction staking shall be provided under the direction of either a professional land surveyor licensed by the State of California or an ENGINEER qualified to perform land surveying.

The survey datum used for the project shall be in accordance or tied-in with the County datum, as referenced on the Plans.

The CONTRACTOR shall provide and establish the construction staking of principal structures, and set grades and benchmarks as required. It will be the CONTRACTOR's responsibility to layout the work from the lines and grades, and to transfer elevations from the benchmarks set. All staking, locating, and layout work required for construction purposes shall be performed by the CONTRACTOR. Where new construction connects to existing facilities, the CONTRACTOR shall check and establish the exact location of existing facilities prior to construction of new facilities.

When using construction stakes to establish alignment, the CONTRACTOR shall use a minimum of three (3) stakes to check horizontal alignments, and a minimum of two (2) stakes to check vertical alignments. CONTRACTOR is responsible for providing the ENGINEER with staking calculations for review three days prior to staking. Separate move in for control will be require prior staking.

Should an occasion arise where the validity of a stake is questionable, either as to its location, or the elevation marked thereon, the CONTRACTOR shall check the stake or stakes in question. The CONTRACTOR shall be responsible for correcting any alignment or elevation errors that resulted from incorrect staking.

The CONTRACTOR shall maintain a complete and accurate log of all control and survey work as it progresses. On completion of site improvements, the CONTRACTOR's surveyor shall prepare a certified survey drawing showing all dimensions, locations, angles, and elevations of construction.

In order for the RCD to produce As-Built Drawings for this project, the CONTRACTOR shall submit a hard copy of the Plans with appropriate as-built information mark-ups (bends, air release valves, top of pipe every 25', crossings, and all changes in direction), which Plans shall

be signed by the CONTRACTOR's surveyor certifying that elevations and locations of improvements are in accordance with the contract Documents. Should the ENGINEER determine that additional information is required to produce accurate As-Built Drawings, the CONTRACTOR shall provide such information within **ten (10) calendar days** after receiving the written request for said additional information. The cost for providing this additional information shall be at the CONTRACTOR's expense, and no additional compensation will be allowed therefor.

The CONTRACTOR shall set or establish the necessary construction layout stakes and markings a minimum of **two (2) working days** in advance of the work, and shall notify the ENGINEER when such markings have been set.

The CONTRACTOR shall protect all monumentation and survey points in their undisturbed location and condition. Damage, as a result of the CONTRACTOR's operations, to the existing monuments, survey markers, or reference points that are not part of this Contract, shall be repaired and replaced at the CONTRACTOR's expense.

The Contract lump sum price paid for this item, "Construction Staking and Layout," shall include full compensation for furnishing all labor, supervision, materials, tools, equipment and incidentals, and for doing all work involved in construction staking, submitting AutoCAD staking calculation three days prior to staking, surveying, and layout, as shown on the Plans, as specified in these Special Provisions, and as directed by the ENGINEER, including providing documentation and as-built survey data to the RCD upon completion of the project, and no additional compensation will be allowed therefor.

The RCD reserves the right to eliminate this item, "Construction Staking and Layout," from the project completely. The CONTRACTOR shall request and receive written confirmation from the RCD as to the status of this item of work prior to incurring any costs. The CONTRACTOR shall not be entitled to any compensation under this item of work for any cost incurred should he proceed in advance of receiving written authorization from the RCD.

## **END OF SECTION**

## **SECTION 101.**

### **WATER POLLUTION CONTROL**

1. Water Pollution Control

**The provisions of Section 7-1.01G, "Water Pollution," of the Standard Specifications are superseded by these Special Provisions and the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP).** Information regarding this program is available at **[www.flowstobay.org](http://www.flowstobay.org)**.

The CONTRACTOR is advised that failure to fully comply with the provisions of this Section and/or Section 20 "Erosion and Sediment Control", and all requirements listed in the California Regional Water Quality Control Board San Francisco Bay Region Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit Order No. R2-2009-0074 (MRP), and where applicable, the State Water Resources Control Board NPDES General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities Order No. 2010-0014-DWQ (Construction General Permit), and any resource agency permits obtained for the project, where applicable, except where amended in writing and signed by the Director of Public Works or his duly authorized representative, shall constitute substantial non-compliance with the requirements of the Clean Water Act, the NPDES permit program, and the Contract.

The RCD shall provide periodic site monitoring to ensure that the work complies with the requirements specified herein and in any resource agency permits. The RCD will provide the CONTRACTOR with copies of the completed monitoring reports. Should any work be found to be non-compliant, a follow up site monitoring visit will be conducted to ensure the items have been corrected. If deficiencies noted during a monitoring visit are not corrected before the follow up monitoring visit, the costs associated with additional follow up visits to correct the noted deficiencies shall be deducted from the final payment for all of the Contract work.

Construction sites are common sources of water pollution. Materials and wastes that blow or wash into a storm drain, gutter, or street have a direct impact on local creeks and wetlands, San Francisco Bay and the Pacific Ocean. The CONTRACTOR shall be responsible for any environmental damage caused by his operations and those of his subcontractors or employees.

Water pollution shall be defined as including the introduction of any material,

including sediment, trash, or other debris, equipment or vehicles into any watercourse, including creeks, ponds, ditches, storm drain facilities, and any surfaces immediately tributary to those areas, except as specifically authorized by any resource agency permits. Water pollution controls are materials and measures that prevent the introduction of any material to any watercourse. Water pollution control materials and measures may consist of temporary silt fencing; straw mulch/straw logs; spill cleanup materials; pavement sweepers; sand bags or continuous berms; etc.

Water pollution controls shall be applied, maintained and removed by the CONTRACTOR as specified herein and as directed by the ENGINEER. For construction activities occurring between June 15 and September 15, sufficient quantities of applicable water pollution control materials shall be available at the work site prior to commencing any work. For construction activities occurring between September 15 and June 15, all applicable water pollution control measures shall be installed and all applicable water pollution control materials shall be available at the work site prior to commencing any work.

A. Water Pollution Control Program

Before starting any work on the project, the CONTRACTOR shall submit, for acceptance by the ENGINEER, a written program including Storm Water Pollution Prevention Plans (SWPPPs) and applicable plan drawings and details to control water pollution effectively during construction of the project. The program shall show the schedule for any erosion control work included in the contract and for all water pollution control measures that the CONTRACTOR proposes to take in connection with construction of the project to minimize the effects of the operations upon water resources. The CONTRACTOR shall not perform any clearing and grubbing or earthwork on the project, other than that specifically authorized in writing by the ENGINEER, until the program has been approved by the ENGINEER.

If the measures being taken by the CONTRACTOR are inadequate to control water pollution effectively, the ENGINEER may direct the CONTRACTOR to revise the operations and the water pollution control program. The directions will be in writing and will specify the items of work for which the CONTRACTOR's water pollution control measures are inadequate. No further work shall be performed on those items until the water pollution control measures are adequate and, if also required, a revised water pollution control program has

been approved. Attention is directed to “CONTRACTOR Response” of this Section for additional provisions relating to correction of the CONTRACTOR’s water pollution control program, and payment.

The ENGINEER will notify the CONTRACTOR of the acceptance or rejection of any submitted or revised water pollution control program within 5 working days.

The RCD will not be liable to the CONTRACTOR for failure to accept all or any portion of an originally submitted or revised water pollution control program, nor for any delays to the work due to the CONTRACTOR’s failure to submit an acceptable water pollution control program or failure to adhere to the provisions of an accepted water pollution control program.

B. CONTRACTOR Response

The CONTRACTOR is advised that he may be required to respond to the work site after hours and/or on weekends or holidays to mitigate potential water pollution, soil erosion or sedimentation and/or to repair damaged water pollution controls. Failure to respond within four (4) hours of notification by the Department of Public Works shall constitute substantial non-compliance with these Special Provisions.

Should the County Road Maintenance Division be required to provide any after-hours, weekend or holiday repairs to the CONTRACTOR’s water pollution controls due to the CONTRACTOR’s failure to respond, all costs associated with providing that response, including overtime wages, equipment and material costs, shall be deducted from the CONTRACTOR’s final payment. The CONTRACTOR shall also be fully responsible for any fines, penalties or mitigations imposed by any regulatory agency caused by his failure to respond, regardless if the County Road Maintenance Division attempts any repairs or pollution prevention work in his absence.

C. Excavation and Grading

The CONTRACTOR shall not commence any excavation, backfilling, grading or stockpiling operations until water pollution control materials have been delivered to the work site. The CONTRACTOR shall certify in writing that the quantity of water pollution control materials at the site is sufficient to protect against water pollution caused by the work, and shall specify the type of material and intended use in the written certification.

Excavation and grading activities shall be scheduled for dry weather periods. Excavation and grading activities shall not be allowed to commence or continue during periods of rainfall or runoff.

The CONTRACTOR may elect to perform excavation or grading activities immediately prior to periods of forecasted rain if he certifies in writing to the ENGINEER that the site will be completely secured against erosion and/or water pollution at the conclusion of the work day and prior to any rainfall. The work site shall be considered as completely secured against erosion and/or water pollution during or prior to forecast periods of rain if the turbidity of runoff from the site does not exceed the turbidity of runoff from adjacent, undisturbed sites by more than 50 NTUs (Nephelometric Turbidity Units). Should the turbidity of runoff from the work site exceed this limit, the CONTRACTOR shall be required to immediately place additional erosion and/or water pollution controls at his expense as directed by the ENGINEER, and shall be subject to any administrative fines or penalties associated with water quality or permit violations, and no additional compensation will be allowed therefore.

D. General Housekeeping

The CONTRACTOR shall control the amount of runoff entering upon disturbed construction and staging areas, particularly during excavation, to reduce the amount of water pollution controls required. Temporary diversion berms and/or sandbags may be employed to divert runoff from entering upon construction and staging areas as approved by the ENGINEER.

Paved surfaces shall be broom-swept as necessary to prevent water pollution. Water spray system of the sweeper units shall be used as appropriate to reduce dust generation. If pavement flushing is necessary, silt ponds or other techniques to trap sediment and other pollutants shall be required.

Dumpsters shall be covered, maintained, and checked frequently for leaks. It is recommended that dumpsters be lined with plastic to prevent leakage of liquids. At no time will the CONTRACTOR be permitted to wash dumpsters at the site.

The CONTRACTOR shall place trashcans and recycling receptacles around the site for use by his forces. Trashcans and recycling receptacles shall be kept covered and shall be emptied at appropriate intervals to reduce litter at the site.

All wastes shall be disposed of properly outside the highway right of way in

accordance with Section 7-15, “Disposal of Material Outside the Highway Right of Way,” and Section 10, “Construction Waste Management,” of these Special Provisions.

The CONTRACTOR shall maintain portable toilets in good working order and wastes shall be disposed of properly. The CONTRACTOR shall check toilets frequently for leaks, and repair or replace any toilets found to be leaking. Portable toilets shall be protected against tipping by ground anchors, bollards, or any other suitable means as approved by the ENGINEER.

E. Stockpiles

All soil and/or rock stockpiles shall be protected against wind, rainfall and runoff at all times. Plastic sheeting may be used to cover soils (including aggregate base), and shall be securely anchored by sandbags or other suitable means. At no time will any stockpiled materials be allowed to erode into any watercourse or onto any roadway or other tributary surface.

F. Vehicle Maintenance

The CONTRACTOR shall designate a completely contained area of the construction site, well away from watercourses and tributary areas, for auto and equipment parking, refueling, and routine vehicle and equipment maintenance. The CONTRACTOR shall require the use of drip pans or drop cloths to catch drips and spills if any vehicle or equipment fluids (e.g. motor oil, radiator coolant, etc.) must be drained on site. Diesel oil shall not be used to lubricate or clean equipment or parts. All spent fluids shall be stored in separate containers, and recycled whenever possible, or disposed of as hazardous waste.

Spills or leaks shall be immediately contained and cleaned up by the CONTRACTOR at his expense, and shall be reported to the ENGINEER immediately after containment.

All vehicles and equipment shall be maintained in good repair. The CONTRACTOR shall inspect frequently for and immediately repair any leaks. The CONTRACTOR shall perform major maintenance, repair jobs, and vehicle and equipment washing off site.

G. Spill Prevention and Response

Fluid spills shall not be hosed down. The CONTRACTOR shall use dry cleanup methods (absorbent materials, cat litter, and/or rags) whenever possible. If water must be used, the CONTRACTOR will be required to collect the water



and spilled fluids and dispose of it as hazardous waste. Spilled fluids shall not be allowed to soak into the ground or enter into any watercourse.

Spilled dry materials shall be swept up immediately. The CONTRACTOR shall not wash down or bury any dry spills. Spills on dirt areas shall be removed by digging up and properly disposing of contaminated soil. The CONTRACTOR shall report significant spills to the ENGINEER immediately.

H. Tire Washing

Should the CONTRACTOR's equipment be tracking soil onto a public road, the ENGINEER shall require a tire-washing swale at the exit from the construction site and/or staging areas. The ENGINEER shall also require that soil be removed from the traveled way by whatever means necessary to prevent water pollution.

I. Roadwork and Paving

The CONTRACTOR shall avoid creating excess dust when breaking and/or removing asphalt or concrete. Broken asphalt and/or concrete pieces shall be completely removed from the site as soon as possible, or shall be stored in a separate, secure stockpile protected against from wind, rainfall and runoff. Material derived from roadway work shall not be allowed to enter any watercourse, or tributary area.

Slurry resulting from sawcutting operations shall be shoveled or vacuumed and completely removed from the site. The CONTRACTOR shall not be permitted to sweep or flush any sawcutting debris or slurry into any watercourse, or tributary area.

J. Concrete and Mortar

The CONTRACTOR shall ensure that concrete and mortar are contained within the lines and grades shown on the Plans and not allowed to leave the construction site. Any excess concrete, mortar and/or mix water placed or spilled beyond the limits of concrete construction as shown on the Plans shall be immediately collected, removed and disposed of properly.

No washout of concrete mixers or trucks will be permitted at the project site.

Dry sacks of cement shall be protected against wind, rainfall and runoff. Opened sacks of cement shall be secured and protected from spilling.

K. Training

CONTRACTOR shall ensure that all persons responsible for preparing, amending and implementing SWPPPs be appropriately trained in accordance with the requirements of the Construction General Permit and these Special Provisions. The CONTRACTOR shall provide documentation of all training for persons responsible for implementing these requirements upon request by the ENGINEER.

When required, the RCD will provide introductory training to the CONTRACTOR, his employees and subcontractors at the job site before work commences for any project with resource agency permits. The training will provide background information on sensitive species, permit requirements and site-specific water quality issues. When not required, the RCD is available to provide such training at the CONTRACTOR's request.

#### **PAYMENT**

The Contract lump sum price paid for this item, "Water Pollution Control," shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work required by these Special Provisions for Water Pollution Control, including submittal of a written program and working drawings, in a form approved by the ENGINEER, as specified in these Special Provisions, the Standard Specifications and as directed by the ENGINEER, and no additional compensation will be allowed therefore.

#### **END OF SECTION**

## SECTION 102

### PVC PRESSURE PIPE

## PART 1 – GENERAL

## 1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide all materials, equipment, and labor necessary to furnish and install 4-inch polyvinyl chloride (PVC) pressure pipe, and all appurtenant work, complete and operable, including all connections as shown on the Drawings and as specified herein.

## 1.2 RELATED WORK SPECIFIED ELSEWHERE

- |    |             |  |
|----|-------------|--|
| A. | Section 103 | Miscellaneous Piping, Valves, Fittings, and Appurtenances. |
| B. | Section 104 | Pressure Pipeline Testing and Disinfection.                |
| C. | Section 107 | Utility Trenching  |

### 1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

### A. Commercial Standards:

- California Regulations Related to Drinking Water (July 1, 2013)-Section 64572, California Waterworks Standards, Title 22 California Code of Regulations (CCR)
- AASHTO, Standard for Highway Bridges.
- AWWA C900, Polyvinyl Chloride (PVC) Pressure Pipe, 4-In. through 12-In., for Water Distribution.
- AWWA Manual M23, PVC Pipe - Design and Installation.
- CAL OSHA

## 1.4 CONTRACTOR SUBMITTALS

- A. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section, as specified in the referenced standards, and the following supplemental requirements:
  - 1. Hydrostatic proof test reports.
  - 2. Sustained pressure test reports.
  - 3. Burst strength test reports.
- B. All expenses incurred in making samples for certification of tests shall be borne by the CONTRACTOR.

## 1.5 QUALITY ASSURANCE

- A. **Tests:** Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of this Section, and as specified in the referenced standards, as applicable.
- B. The CONTRACTOR shall have said material tests performance at no additional costs to the RCD. The ENGINEER shall have the right to witness all testing provided, that the CONTRACTOR'S schedule is not delayed for the convenience of the ENGINEER.
- C. In addition to those tests specifically required, the ENGINEER may request additional samples of any material for testing by the RCD. The additional samples shall be furnished at no additional cost to the RCD.

## PART 2 -- PRODUCTS

### 2.1 GENERAL

- A. 4-inch PVC pressure pipe shall conform to the applicable requirements of AWWA C900 DR-14 (305 psi) respectively, and shall be subject to additional requirements specified herein.
- B. All PVC pipe shall be continuously marked in conformance with the appropriate ASTM.
- C. All 2 inch and less shall be Type K copper.

### 2.2 PIPE DESIGN

- A. **General:** PVC pressure pipe shall be designed in accordance with the requirements of AWWA C900.

### 2.3 PIPE

- A. The pipe shall be of the diameter and pressure class as specified or shown, furnished complete

with rubber gaskets, and all specials and fittings shall be provided as required. The dimensions and pressure classes for Dimension Ratios for PVC pressure pipe with Cast-Iron Pipe Equivalent O.D.'s shall conform to the requirements of AWWA C 900.

- B. **Joints:** All joints for the buried PVC pipe shall be an integral bell manufactured on the pipe employing a rubber ring joint. The bell shall be the same or greater thickness as of the pipe barrel.
- C. **Joint Deflection:** Deflection at the joint shall not exceed 1.5 degrees for C900 or the maximum deflection recommended by the manufacturer. No deflection of the joint shall be allowed for joints which are over-belled or not belled to the stop mark.
- D. Bending of pipe shall not exceed recommendations of AWWA or manufacturers printed recommendations.

## 2.4 FITTINGS

- A. Fittings shall be ductile iron and shall conform to the requirements of AWWA C 110 or AWWA C153 minimum Class 250. Fittings shall be mechanical joint.
- B. Restrained joints shall be as approved in writing by the ENGINEER.
- C. All fittings shall be lined and coated in accordance with the manufacture requirements.
- D. Each fitting shall be clearly labeled to identify its size and pressure class.
- E. **Service Saddles and Tapping Sleeves:** All service saddles, and tapping sleeves shall be in accordance with the requirements of Section 103, "Miscellaneous Piping, Valves, Fittings, and Appurtenances."
- F. Polywrap all ductile iron pipe fittings per Section 116, "Polywrap".

## PART 3 -- EXECUTION

### 3.1 GENERAL

- A. All laying, jointing, testing for defects and for leakage shall be performed in the presence of the ENGINEER, and shall be subject to its approval before acceptance. All material found during the progress to have defects will be rejected and the CONTRACTOR shall promptly remove such defective materials from the site of the work.
- B. Installation shall conform to the requirements of AWWA Manual M23, instructions furnished by the pipe manufacturer, and to the supplementary requirements or modifications specified herein. Wherever the provisions of this Section and the aforementioned requirements are in conflict, the more stringent provision shall apply.

### 3.2 SAWCUT ASPHALT CONCRETE AND PORTLAND CEMENT CONCRETE

- A. Sawcut asphalt concrete and Portland cement concrete pavement shall conform to these Special Provisions and the directions of the ENGINEER.
- B. Existing asphalt concrete pavement and Portland cement concrete pavement shall be sawcut along water line trenches, as shown on the Plans and as directed by the ENGINEER. The exact limits shall be as shown on the Plans, unless prior approval for adjustment is given by the ENGINEER. The CONTRACTOR shall provide a neat, clean, uniform joint along water line trenches, as directed by the ENGINEER. The CONTRACTOR is advised that the method used to provide a neat, clean, uniform joint shall be subject to the approval of the ENGINEER.
- C. All sawcutting operations shall be performed with a power driven saw and the sawcut shall extend completely through the pavement. The use of pavement breakers or other pneumatic devices for cutting pavement will not be permitted unless specifically authorized, in writing, by the ENGINEER.
- D. Cracked or broken pavement caused by the CONTRACTOR's operations shall be removed to a line established by the ENGINEER and shall be replaced with new asphalt concrete pavement or Portland cement concrete pavement all at the CONTRACTOR's expense, and no additional compensation will be allowed therefor. Any such pavement to be removed shall be cut to a neat, trim line and replaced as directed by the ENGINEER.

### 3.3 PIPE HANDLING

- A. **Handling:** Pipe, fittings and accessories shall be carefully inspected before and after installation and those found defective shall be rejected. Pipe and fittings shall be free from fins and burrs. Before being placed in position, pipe, fittings, and accessories shall be cleaned, and shall be maintained in a clean and sanitary condition. Proper facilities shall be provided for lowering sections of pipe into trenches. Under no circumstances shall pipe, fittings or any other material be dropped or dumped into trenches.

### 3.4 STORAGE

- A. Pipe shall be stored, if possible, at the job site in unit packages provided by the manufacturer. Caution is to be exercised to avoid compression damage or deformation to bell ends of the pipe. Pipe shall be stored in such a way as to prevent sagging or bending and protected from exposure to direct sunlight by covering with an opaque material while permitting adequate air circulation above and around the pipe. Gaskets shall be stored in a cool, dark place out of the direct rays of the sun, preferably in original cartons. Pipe, fittings, or accessories improperly stored are subject to rejection by the ENGINEER.

### 3.5 INSTALLATION

- A. Bell and spigot pipe shall be laid with the bell end pointing in the direction of laying. Pipe shall be set to grade in straight lines, taking care to avoid the formation of any dips or low points. Pipe shall not be laid when the conditions of trench or weather are unsuitable as determined by ENGINEER. At the end of each day's work, open ends of pipe shall be closed temporarily with water-tight, expandable type plugs.
- B. Pressurized lines laid on a downhill grade shall be blocked and held in place until sufficient support is furnished by the following pipe to prevent movement. **Water lines shall be laid uphill on grades exceeding 10 percent.**
- C. Pipe shall be supported at its proper elevation and grade, care being taken to secure firm and uniform support. Wood support blocking will not be permitted. The full length of each section of pipe and fittings shall rest solidly on the pipe bed, with recessed excavation to accommodate bells and joints. Anchors and supports shall be provided where necessary and where indicated on the Drawings for fastening work into place. Fittings shall be independently supported.
- D. Joints shall be installed according to manufacturer's recommendations. Trenches shall be kept free of water until joints have been properly made. The maximum combined deflection at any coupling shall be in accordance with the manufacturer's printed recommendations.
- E. Pipe shall be cut by means of saws, power driven abrasive wheels or pipe cutters, which will produce a square cut. No wedge-type roller cutters will be permitted. After cutting, the end of the pipe shall be beveled using a beveling tool, portable type sander or abrasive disc.
- F. All necessary precautions shall be taken to prevent uplift or floating of the pipe prior to the completion of the backfilling operation. The CONTRACTOR shall assume full responsibility for any damage due to this cause and shall, at its own expense, restore and replace the pipe to its specified condition and grade if it is displaced due to floating.
- G. Each pipe elastomeric gasket joint shall be installed in conformance with the manufacturer's printed recommendations.

### 3.6 COPPER WIRE AND WARNING TAPE

- A. Installation of copper wire, warning tape, and pipe identification shall conform to Section 106, "Piping Identification Systems."

### 3.7 SERVICE CONNECTIONS

- A. **Service Connections:** Service saddles or fittings for PVC pipe shall be used for all service connections on new pipeline installations. On existing PVC pipelines all service connections

shall be tapping sleeves. Service saddles shall have a bearing area of sufficient width along the axis of the pipe, so that the pipe will not be distorted when the saddle is made tight. An internal shell cutter shall be used to drill through the corporation stop to minimize PVC shavings, retain the coupon, and reduce stress. **Single fluted shell cutters or twist drills will not be allowed.** Lubricate the cutting and tapping edges of the tool with cutting lubricant. Make the cuts slowly and use the follower very lightly. Do not force cutter through pipe wall. Shell cutter shall have sufficient throat depth to handle the heavy wall PVC pipe. Maximum outlet size permitted with service saddle is 2 inches.

- B. Tapping sleeves and valves shall be used for all outlets greater than 2 inches in diameter. Tapping sleeves shall be assembled and installed in accordance with the manufacturer's printed recommendations and Section 103, "Miscellaneous Piping, Valves, Fittings, and Appurtenances."

### 3.8 ADJUSTMENT OVER/UNDER EXISTING UTILITY

- A. If case "A" or "B" per sheet C3.1 occur during construction, all fitting shall be flange to flange with class 52 Ductile Iron pipe.
- B. Ductile Iron Pipe: Pipe materials shall conform to the requirements of ANSI/AWWA C151.
- C. Cement Mortar Lining: Cement for mortar lining for water systems shall conform to the requirements of ANSI/AWWA C104; provided that cement for mortar lining shall be Type II for potable water systems. A fly ash or pozzolan shall not be used as a cement replacement.
- D. External Coating: External coatings for buried Ductile Iron pipe using potable water shall be Polyethylene encasement or coal tar paint, in conformance to Section 117, "Protective Coating".
- E. Polywrap: Polywrapping for buried Ductile Iron pipe shall conform to Section 116, "Polywrap".

### 3.9 TESTING AND DISINFECTION

- A. Field testing and disinfection of all pressure pipe shall conform to the requirements of Section 104, "Pressure Pipeline Testing and Disinfection."

## PART 4 - PAYMENT



The contract lump sum price paid for **4-inch PVC C-900 DR-14 Pipe** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in saw cutting and removing asphalt concrete and base (as required), dewatering (as required), trenching, sheeting, shoring, excavating and backfilling, installation of the 4" PVC C-900 DR-14 water main, warning tape and tracer wire, including all bends, ductile iron mechanical joint and flanged joint fittings, valves, valve boxes, couplers, thrust blocks, trench backfill and surface restoration, asphalt concrete, class 2 aggregate base, tree protection, replacing full pavement section at trench per County Detail, trench barricades and protection, providing temporary AC cutback at the end of each day, flushing, hydrostatic testing, disinfection, disposal of chlorinated water, bacteriological exam & final flushing, complete in place, as shown on the plans, as specified in the Standard Specification and these Special Provisions, and as directed by the ENGINEER.

**END OF SECTION**

**SECTION 103**  
**MISCELLANEOUS PIPING, VALVES, FITTINGS,**  
**AND APPURTENANCES**

**PART 1 -- GENERAL**

**1.1 THE REQUIREMENT**

- A. The CONTRACTOR shall provide all materials, equipment, and labor necessary to furnish and install all exposed and buried piping, complete, including but not necessarily limited to small steel pipe, small valves, red brass pipe, copper tubing, solvent-welded PVC pipe, fittings, gaskets, bolts, insulating connections, gate valves, complete and operable, including but not necessarily limited to operators, epoxy lining and coating, and appurtenant work and all such other specialties as required for a complete and operable piping system, as shown on the Drawings and as specified herein. Unless otherwise shown or specified, all shut-off valves 12 inches and smaller shall be Gate Valves. All piping and fittings shall be lead-free.

**1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

**A. Commercial Standards:**

ANSI B16.22	Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
ANSI/ASME B16.3	Malleable Iron Threaded Fittings, Classes 150 and 300.
ANSI/ASME B16.15	Cast Bronze Threaded Fittings, Classes 125 and 250.
ANSI/ASME B31.1	Power Piping, DoD Adopted.
ASTM A 53	Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
ASTM A 106	Specification for Seamless Carbon Steel Pipe for High-Temperature Service.
ASTM A 325	Specification for Structural Bolts, Steel, Heat-Treated,

120/105 ksi minimum tensile strength.

ASTM B 43	Specification for Seamless Red Brass Pipe, Standard Sizes.
ASTM B 62	Specification for Composition Bronze or Ounce Metal Castings.
ASTM B 88	Specification for Seamless Copper Water Tube.
ASTM D 1785	Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
ASTM D 2239	Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR). Based on Controlled Inside Diameter.
ASTM D 2737	Specification for Polyethylene (PE) Plastic Tubing.
AWWA C207	Standard for Steel Pipe Flanges for Waterworks Service - Sizes 4 inch through 144 inch.
AWWA C509	Standard for Resilient-Seated Gate Valves for Water and Sewerage Systems.
AWWA C 800	Standard for Underground Service Line Valves and Fittings.
AWWA Manual M 11	Steel Pipe - A Guide for Design and Installation.

#### 1.4 CONTRACTOR SUBMITTALS

- A. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

1. Manufacturers product specifications and performance details shall be provided for all products and materials proposed to be used under this Section.

## PART 2 -- PRODUCTS

### 2.1 COPPER TUBING (FOR WATER SERVICES)

- A. Copper tubing shall conform to the requirements of ASTM B 88 and shall be Type K, soft temper, joint free, for buried tubing; and hard-drawn joint free, for above-ground applications. All fittings connecting copper tubing shall be compression fittings.

### 2.2 BRASS PIPE

- A. Brass pipe shall conform to the requirements of ASTM B 43. Fittings shall be of bronze conforming to the requirements of ASTM B 62 with threaded ends, conforming to ANSI/ASME B16.15.
- B. Two-inch brass street elbows, for Dead End and In-Line Blowoffs shall be **Jones 2619, Ford F84.77-G, or approved equal.**

### 2.3 CORPORATION STOP VALVES

#### A. Tapered Plug Type

1. Tapered plug style valves shall be brass conforming to AWWA C800
2. The connection joint to the service saddle shall be in conformance with AWWA C800 iron pipe thread.
3. The connection joint to the service lateral shall be a "Pack Joint Type" compression joint.
4. Tapered plug style valves on steel or ductile iron pipe shall utilize a threaded insulating bushing between the tapping outlet or service saddle on the water main and the stop valve.

#### B. Ball Valve Type

1. Ball valve style valves shall be brass conforming to AWWA C800.
2. The connection joint to the service saddle shall be in conformance with AWWA C800 iron pipe thread.
3. The connection joint to the service lateral shall be a "Pack Joint Type" compression joint.
4. Ball valve style valves on steel or ductile iron pipe shall utilize a threaded insulating bushing between the tapping outlet or service saddle on the water main and the stop valve.

#### C. Manufacturers, or approved equal.

1. Copper tubing sizes, 1", 1-1/2", 2" services:

Size	Mueller	Jones	Ford
1"	P25028	J-1935	FB-1100-4

1 ½"	P-25028	J-1935	FB-1100-6
2"	P-25028	J-1935	FB- 1100-7

#### 2.4 SERVICE SADDLES

- A. Service saddles shall be bronze or stainless steel for use on plastic and steel or iron for use on ductile iron pipe.
- B. The service tap on the service saddle shall have an AWWA C800 iron pipe thread.
- C. **Manufacturers, or approved equal**

Pipe Type	Mueller	Jones	Ford
Plastic PVC C900	BR2S0474	J-969	FC202

#### 2.5 WELD-O-LETS

- A. For 1", 1-1/2", and 2" service connections to steel mortar lined and coated pipe use 3000#, forged steel, **Bonney Forge Co., "Weldolet," Allied Piping Products Co., "Branchlet; or approved equal.**

#### 2.6 AIR RELEASE VALVES

- A. Air release valves shall be **Crispin P-Series, APCO 200 Series, or approved equal.**

#### 2.7 PIPE SUPPORTS

- A. All piping systems and pipe connections to equipment shall be properly supported to prevent undue deflection, vibration and stresses on piping, equipment and structures. All supports and parts thereof shall conform to the requirements of ANSI/ASME B31.1, except as supplemented or modified by this Section.

#### 2.8 STOCK PARTS

- A. Where not specifically shown or detailed use stock or production parts wherever possible. Such parts shall be new, of best commercial quality, designed and rated for the intended purpose.

#### 2.9 PIPE FLANGES

- A. **Flanges:** Where the design pressure is up to a maximum of 275 psi, flanges shall conform to either AWWA C207 Class E or ANSI B16.5 for 150-pound flanges. Flanges shall have flat faces and shall be attached with bolt holes straddling the vertical axis of the pipe unless otherwise shown. Attachment of the flanges to the pipe shall conform to the applicable

requirements of AWWA C207. Flanges for miscellaneous pipes shall be in accordance with the appropriate Specification Sections for these pipes.

- B. **Blind Flanges:** Blind flanges shall be in accordance with AWWA C207, or with the appropriate Specification Sections for the various pipe types.
- C. **Flange Coating:** All machined faces of metal blind flanges and pipe flanges shall be coated with a temporary rust-inhibitive coating to protect the metal until the installation is completed.
- D. **Flange Bolts:** All bolts and nuts shall be stainless steel and conform to AWWA. Studs and bolts shall extend through the nuts a minimum of 1/4 inch. All-thread studs shall be used on all valve flange connections where space restrictions preclude the use of regular bolts.
- E. **Insulating Flange Sets:** Insulating flange sets shall be provided where shown. Each insulating flange set shall consist of an insulating gasket, insulating sleeves and washers and a steel washer. Insulated flanges shall have bolt hole diameter 1/4 inch greater than the bolt diameter. Insulating sleeves shall be 1/32 inch-thick NEMA LI-1 (1989) Grade G-10 fiberglass epoxy. Washers shall be 5/32 inch-thick NEMA LI-1 (1989) Grade G-10 fiberglass epoxy. Steel washers, bolts and nuts shall be in accordance with ASTM A 325. Insulating gaskets shall be 1/8 inch-thick full-face Neoprene-faced phenolic.
- F. **Insulating Flange Manufacturers, or Approved Equal:**
  - 1. **JM Red Devil, Type E**
  - 2. **Maloney Pipeline Products Co.**
  - 3. **PSI Products, Inc.**
- G. **Flange Gaskets:** Gaskets for flanged joints shall be full-faced, 1/16 inch-thick compressed sheets of aramid fiber base, with nitrile binder and non-stick coating, suitable for temperatures to 700 degrees F, a pH of one to 11, and pressures to 1000 psig. Blind flanges shall have drop-in gaskets. Drop-in gaskets shall be 1/4 inch smaller than the inside edge of the bolt holes. Ring gaskets will not be allowed.

## 2.10 GATE VALVE

- A. **General:** All gate valves shall be resilient-seated, of the inside screw type. Valves shall be capable of being repacked under line pressure. All ferrous surfaces of the valves shall be factory fusion bonded epoxy lined and coated, as specified, in conformance with AWWA
- B. **Elastomers:** All elastomers used in valves shall be made of EPDM synthetic polymers that are specifically developed for their chemical resistance. EPDM elastomers are to be used in both the gate valves and butterfly valves.

- C. Resilient-seated gate valves conforming to AWWA C509 shall be provided. Resilient-seated gate valves shall have cast iron bodies with flanged or mechanical joint ends, elastomer-coated cast iron wedge/disc, flanged bonnet, bronze stem, O-ring seals, and operators with handwheel or square nut, unless otherwise shown.
- D. **Manufacturers, or Approved Equal:**
  - 1. **Mueller A-2370**
  - 2. **M and H No. 4067, Kennedy 1500, Clow**

## 2.11 FITTINGS

- A. Copper Water Tube: Fittings for copper water tube shall be designed for working pressures up to 150 psig. Fittings used in service lines shall be designed for connection to the service line by compression connection. Fittings shall be Mueller 110 Compression Connection Series fittings, or approved equal.

CONTRACTOR is responsible for identifying existing pipe material and using the appropriate fittings to tie-in existing pipe to new pipe. With new tie-in connection, cut existing service line, splice to new service with compression fitting.

## 2.12 REDUCER FITTING

- A. CONTRACTOR shall use the appropriate reducer fitting to connect to the existing service.

# PART 3 -- EXECUTION

## 3.1 INSTALLATION

- A. **Plastic Pipe:** PVC pipe joints shall be solvent-welded in accordance with the manufacturer's printed instructions.
- B. **Couplings:** Pipe couplings shall be installed in strict accordance with the manufacturer's printed recommendations, using the correct style coupling and gasket as appropriate.
- C. **Gaskets for Flanged Joints:** Gaskets shall be in accordance with manufacture requirements.
- D. **Insulating Connections:** All insulating connections shall be installed in accordance with manufacturer's printed instructions." Care shall be exercised to prevent damage to insulating fittings while making up the joints.
- E. Unless otherwise shown on the Drawings, service saddles, tapping sleeves, tapping outlets and Weld-O-Lets shall be field coated equal to the existing pipe coating.

- F. Tapping of any existing main shall be coordinated with the ENGINEER. A minimum of 48 hours notice shall be given to the ENGINEER before installation. The ENGINEER will be present during the tapping process. After completion of the tap the Coupon ("Cookie") shall be given to the ENGINEER.
- G. Plastic water service pipe or tubing shall be installed joint free between the corporation stop valve and angle meter stop valve.
- H. Water Sampling Stations shall be installed at the locations shown and in conformance with the Drawings.
- I. Installation of warning tape and copper wire shall be in conformance with Section 106, "Piping Identification Systems."
- J. All gate valves shall be installed in accordance with AWWA Standards and the manufacturer's printed recommendations, and in accordance with the applicable special provisions.

#### **PART 4 - PAYMENT**

The contract lump sum price paid for **"Water Connection (Entry)"** and **"Water Connection (Exit)"** shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in installing water service, including locating existing utilities, verifying direction of pipes and flow, coordinating with RCD for shutdown of any valves, and installation of all pipes, valves, bends, thrust blocks, warning tape and tracer wires, couplings to connect to existing water mains, mechanical restraints and fittings, as shown on the Plans, At each connection include: providing water tight pressure plugs if necessary on the existing lines to be abandoned (until completely abandoned), surface restoration, removal of existing water main pipe in conflict with new pipe, dewatering, trenching, shoring, excavating and backfilling, compacting, notifying RCD of any disruptions to service, furnishing and installation of couplers, bolts, nuts, washers, restraint fittings, polyethylene encasement, bedding, backfill, asphalt concrete, class 2 aggregate base, pavement section, complete in place, as shown on the plans, as specified in the Standard Specification and these Special Provisions, and as directed by the ENGINEER.

#### **END OF SECTION**



## SECTION 104

### PRESSURE PIPELINE TESTING AND DISINFECTION

## PART 1 -- GENERAL

## 1.1 REQUIREMENT

- A. The CONTRACTOR shall furnish all materials, equipment, and labor to perform and complete flushing and testing of all pipelines and appurtenant piping, and disinfection of all pipelines and appurtenant piping for potable and recycled water, complete, including conveyance of test water from RCD-designated source to point of use and all disposal thereof, and as specified herein.

## 1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

### A. Commercial Standards:

AWWA B300	Standard for Hypochlorites.
AWWA C651	Standard for Disinfecting Water Mains.

### 1.3 CONTRACTOR SUBMITTALS

- A. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.
- B. A testing schedule, including proposed plans for water conveyance, control, disposal, and disinfection shall be submitted in writing to the ENGINEER for review a minimum of 72 hours before testing is to start.

## 1.4 TESTING AND DISINFECTION

- A. The CONTRACTOR will test the pipe for pressure and disinfection. All testing will be conducted in the presence of the ENGINEER.

## **PART 2 -- PRODUCTS**

### **2.1 MATERIAL REQUIREMENTS**

- A. All test equipment, chemicals for chlorination, temporary valves or assemblies, bulkheads, or other water control equipment and materials shall be determined and furnished by the CONTRACTOR subject to the ENGINEER'S review. No materials shall be used which would be injurious to the piping system or its proposed function.
- B. Chlorine for disinfection shall be in the form of sodium hypochlorite solution, or calcium hypochlorite granules or tablets.
- C. Sodium hypochlorite and calcium hypochlorite shall be in accordance with the requirements of AWWA B300.

## **PART 3 -- EXECUTION**

### **3.1 GENERAL**

- A. The CONTRACTOR shall be responsible for all testing and shall make all necessary provisions for conveying the water from the RCD-designated source to the points of use.
- B. All pressure pipelines shall be tested. Disinfection shall be accomplished by chlorination. All chlorinating and testing operations shall be performed in the presence of the ENGINEER.
- C. Bacteriological testing will be performed by the ENGINEER. Results of the bacteriological testing must meet the requirements of the State Department of Health Services.

### **3.2 HYDROSTATIC TESTING OF PIPELINES**

- A. Connections for testing of pipe shall be in conformance with the Drawings.
- B. The CONTRACTOR shall test all pipelines as a single unit, or in sections if approved by the ENGINEER. The length of the test section in any one test shall not exceed 1,500 feet, the distance between closed valves, or as directed by the ENGINEER. The test may be made by closing new valves when available, or by placing temporary bulkheads in the pipe and filling

the line slowly with water. Unless approved by the ENGINEER testing shall not be performed against existing system closed valves. The CONTRACTOR shall be responsible for ascertaining that all test bulkheads are suitably restrained to resist the thrust of the test pressure without damage to, or movement of, the adjacent pipe. Any unharnessed sleeve-type couplings, expansion joints, or other sliding joints shall be restrained or suitably anchored prior to the test, to avoid movement and damage to piping and equipment. The CONTRACTOR shall provide sufficient temporary air release assemblies to allow for evacuation of all entrapped air in each pipe unit or section to be tested. After completion of the tests, such taps shall be permanently plugged. Care shall be taken to see that all air release assemblies are open during filling.

- C. The pipeline shall be filled at a rate which will not cause any surges or exceed the rate at which the air can be released through the air release assemblies at a reasonable velocity and all the air within the pipeline shall be properly purged. After the pipeline unit or section thereof has been filled, it shall be allowed to stand under pressure for at least 24 hours to allow the pipe concrete or mortar lining, as applicable, to absorb what water it will and to allow the escape of air from any air pockets. During this period, bulkheads, valves, and connections shall be examined for leaks. If leaks are found, corrective measures satisfactory to the ENGINEER shall be taken.
- D. The hydrostatic test shall consist of holding the test pressure on the pipeline for a period of 4 hours. The test pressure for pipelines shall be 100 percent of the pipe pressure class. The test pressure for piping shall be as shown or specified, measured at the lowest point of the pipeline unit or section being tested. All visible leaks shall be repaired in a manner acceptable to the ENGINEER.
- E. **Maximum Leakage**
  - 1. The maximum allowable leakage for pressure pipelines shall be in accordance with the following formula:

Design Basis

$$L = \frac{ND\sqrt{P}}{7400}$$

Where: L	=	allowable leakage (gal/hr)
N	=	number of joints in the tested line
D	=	nominal diameter of pipe (in.)
P	=	average test pressure (psi)

Pipe with welded joints, flanged joints, and service lateral pipe shall have no leakage.

2. In the case pipelines fail to pass the prescribed leakage test, the CONTRACTOR shall determine the cause of the leakage, shall take corrective measures necessary to repair the leaks, and shall again test the pipelines.

### 3.3 DISINFECTING PIPELINES

A. **General:** All water pipelines shall be disinfected. Pipeline disinfection operations shall be performed at the Primary Jumper location in conformance with the Drawings.

B. **Chlorination:** Hypochlorite shall be used to chlorinate the piping system in accordance with the requirements of AWWA C651 and as modified by this Section. Care shall be taken to prevent chlorine solution in the pipeline being disinfected from flowing back into the pipeline supplying the water. Any one of the following 2 methods as listed in the AWWA standard (brief summary of two methods as modified below) can be used for the initial disinfection; however, if the pipeline fails a bacteriological test, it must be disinfected again by the slug method:

1. The continuous feed method consists of placing calcium hypochlorite granules in the main during construction, completely filling the main to remove all air pockets, flushing the completed main to remove particulates, and filling the main with potable water. The potable water shall be chlorinated so that after a minimum 24 hour holding period in the main there will be a free chlorine residual of not less than 25 mg/l.
2. The slug method consists of placing calcium hypochlorite granules in the main during

construction, completely filling the main to eliminate all air pockets, flushing the main to remove particulates and slowly flowing through the main a slug of water dosed with chlorine to a concentration of 100 mg/l.

- C. **Retention Period:** Chlorinated water shall be retained in the pipeline long enough to destroy all non-spore-forming bacteria. This period shall be at least 24 hours but disinfecting solution higher than 50 mg/l shall not remain in the pipeline for more than 96 hours. After the chlorine-treated water has been retained for the required time, the free chlorine residual at the pipeline extremities and at other representative points shall be at least 25 mg/l.
- D. **Valve Disinfection:** During the process of chlorinating the pipelines, all valves and other appurtenances shall be operated while the pipeline is filled with the heavily-chlorinated water.
- E. **Final Flushing:** After the retention period, the heavily chlorinated water shall be flushed from the pipeline until chlorine measurements show that the concentration in the water leaving the pipeline is no higher than that generally prevailing in the existing system. The CONTRACTOR shall apply a reducing agent to the water to thoroughly neutralize the chlorine residual remaining in the water prior to disposal of the water. The CONTRACTOR will be solely responsible for the proper disposal of all water used for the disinfection process in accordance with regulatory agency requirements. With prior approval by the ENGINEER, the CONTRACTOR may discharge the heavily chlorinated water into the sanitary sewer system in lieu of the above neutralization requirements.
- F. **Bacteriological Testing:** Pipe shall be left for a period of 24 hours after final flushing before any sample is collected. A sample, or samples will be collected by the ENGINEER and will be tested for bacteriological quality in accordance with the requirements of the State Department of Health Services. Should the initial disinfection treatment fail to produce satisfactory bacteriological test results, the disinfection procedure shall be repeated until acceptable results are obtained. All lab costs for bacteriological testing will be paid by the CONTRACTOR. All costs for water used for flushing, and re-filling of the pipeline after failure of a bacteriological test shall be borne by the CONTRACTOR.

### 3.4 CONNECTIONS TO EXISTING SYSTEM

- A. Where connections are to be made to an existing potable water system, the interior surfaces of all pipe and fittings used in making the connections shall be swabbed or sprayed with a sodium hypochlorite solution in conformance with the requirement of AWWA C651, except that the solution shall be 5 percent, before they are installed.

### **PART 4 - PAYMENT**

Full compensation for doing all work conforming to the requirements of this section shall be considered as included in the contract price paid for the various Contract items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**

**SECTION 105**

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**END SECTION**

## SECTION 106

### PIPING IDENTIFICATION SYSTEMS

## PART 1 -- GENERAL

## 1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide all materials, equipment, and labor necessary to furnish, mark, and install identification devices for piping, valves, and appurtenances using warning tape, buried wire, color codes, lettering, and related permanent identification devices as required and as specified herein.

## 1.2 RELATED WORK SPECIFIED ELSEWHERE

- ## A. Division 1 General Requirements.

### 1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- ### A. Commercial Standards:

- ANSI A13.1 Scheme for the Identification of Piping Systems.

## 1.4 CONTRACTOR SUBMITTALS

- A. Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

## PART 2 -- PRODUCTS

## 2.1 IDENTIFICATION OF BURIED PIPING

- A. Identification of all buried pressure pipe shall be accomplished by color-coded warning tape consisting of a minimum 2-inch-wide plastic tape with lettering giving a warning and a description of the pipe function (for example: "WARNING, WATER LINE BURIED BELOW").



- B. Warning Tape manufacturer shall be **THOR ENTERPRISES, CALPICO, or equal.**
- C. In addition, for all non-metallic buried pressure pipe systems a No. 10 A.W.G. UF Insulated solid copper wire shall be attached to the pipeline installed via trenching methods.
- D. Tape to hold the wire in place shall be pipe wrap tape, 2 inches wide, 10 mil thickness.

### **PART 3 -- EXECUTION**

#### **3.1 WARNING TAPE**

- A. Warning tape shall be installed with all buried pressure piping. The tape shall be placed directly at the top of the Pipe Zone installed via trenching methods.

#### **3.2 TRACER WIRE**

- A. In addition, for all non-metallic buried pressure pipe systems a No. 10 A.W.G. UF Insulated solid copper wire shall be attached to the pipeline.
  - 1. Nonmetallic pipes shall be fitted with a tracer wire which shall be attached to the top of the pipe at a maximum of 5 ft intervals. When metallic pipes tie-in into non-metallic pipes, the existing tracer wire from non-metallic pipes must be extended into the nearest valve.
  - 2. Tracer wire shall be #10 AWG HMW-PE insulated solid copper wire.
  - 3. The tracer shall be attached to the pipe at 10 ft intervals
  - 4. Tracer wire shall be continuous, and wire on any laterals shall be spliced into wire on main lines. Splices shall be covered with water resistant heat-shrink tubing. Wire nuts or electrical tape will not be acceptable.
  - 5. Tracer wire shall be brought up to surface at valves, buildings, hydrants, or any point where the pipe rises above grade. At valves, bring tracer wire up to on the outside of PVC (or C.I., soil pipe) valve access riser.

6. The wire shall terminate with a three-foot length exposed inside valve boxes, at hydrants, and where the pipe extends above grade to provide attachment points for pipe locating equipment.

#### **PART 4 - PAYMENT**

Full compensation for doing all work conforming to the requirements of this section shall be considered as included in the contract price paid for the various Contract items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**

## **SECTION 107**

### **UTILITY TRENCHING**

#### **PART 1 -- GENERAL**

##### **1.1 THE REQUIREMENT**

- A. The CONTRACTOR shall provide all materials, equipment, and labor necessary to perform and complete all utility earthwork as shown on the Drawings and as specified herein.
- B. The work of this Section includes all earthwork required for construction of the project. Such earthwork shall include, but may not necessarily be limited to, the loosening, removing, loading, transporting, depositing, and compacting in its final location of all materials wet and dry, as required for the purposes of completing the work, which shall include, but not necessarily be limited to, the furnishing, placing, and removing of sheeting, shoring and bracing necessary to safely support the sides of all excavations; all pumping, ditching, draining and other required measures for the removal or exclusion of water from the excavation; the supporting of structures above and below the ground; all backfilling around structures and all backfilling of trenches and pits; the disposal of excess excavated materials; borrow of materials to make up deficiencies for fills; and all other incidental earthwork.
- C. Hazardous materials shall be handled in accordance with all regulatory agency requirements.

##### **1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

###### **A. State Codes:**

California Labor Code.

Construction Safety Orders of the State of California.

###### **B. State of California (Caltrans) Standards:**

- 1. Standard Specifications:

Section 25                      Aggregate Subbases.

Section 26                      Aggregate Bases.

Section 68                      Subsurface Drains.

Section 88                      Engineering Fabrics

**C. Commercial Standards:**

ASTM D 422                      Test Method for Particle-Size Analysis of Soils.

ASTM D 1556                      Test Method for Density of Soil in Place by the Sand-Cone Method.

ASTM D 1557                      Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10-lb (4.54-kg) Rammer and 18-in. (457-mm) Drop.

ASTM D 1633                      Test Method for Compressive Strength of Molded Soil-Cement Cylinders.

ASTM D 2419                      Method for Sand Equivalent Value of Soils and Fine Aggregate.

ASTM D 2487                      Test Method for Classification of Soils for Engineering Purposes.

ASTM D 2922                      Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).

ASTM D 3017                      Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).

ASTM D 3776	Test Methods for Mass Per Unit Area (Weight) of Woven Fabric.
ASTM D 3786	Method of Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Bursting Strength Tester Method.
ASTM D 4253	Test Methods for Maximum Index Density of Soils Using a Vibratory Table.
ASTM D 4254	Test Methods for Minimum Index Density of Soils and Calculation of Relative Density.
ASTM D 4318	Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
ASTM D 4491	Test Methods for Water Permeability of Geotextiles by Permittivity.
ASTM D 4632	Test Method for Grab Breaking Load and Elongation of Geotextiles.
ASTM D 4751	Test Method for Determining the Apparent Opening Size of a Geotextile.
OSHA	Occupational Safety and Health Administration.

#### 1.4 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR'S attention is directed to 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 5 feet deep or over, shall submit to the ENGINEER for review for compliance with Section 6705 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 standards established in the Construction Safety Orders of the State of California, such alternative system plans shall be prepared, stamped and signed by a civil or structural ENGINEER licensed in the State of California at the CONTRACTOR'S expense.

- B. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.
- C. For all materials that are not pre-approved by the RCD the CONTRACTOR shall designate the source and/or submit samples of all materials in advance of their use for required testing and ENGINEER's approval. All testing costs shall be at the CONTRACTOR'S expense.

#### 1.5 QUALITY ASSURANCE

- A. **General:** All soils testing will be done by a testing laboratory of the RCD'S choice at the CONTRACTOR's expense except as otherwise specified in Paragraph 1.5 C. below.
- B. Where soil material is required to be compacted to a percentage of maximum density the maximum density at optimum moisture content will be determined in accordance with ASTM D 1557. Where cohesionless, free draining soil material is required to be densified to a percentage of relative density the calculation of relative density will be determined in accordance with ASTM D 4253 and D 4254. Field density in-place tests will be performed in accordance with ASTM D 2922, or by such other means acceptable to the ENGINEER.
- C. In case the first test and one re-test of the fill or backfill show non-compliance with the requirements, the CONTRACTOR shall accomplish such remedy as may be required to insure compliance. All test shall be at the CONTRACTOR'S expense.
- D. The CONTRACTOR shall notify the ENGINEER at least 48 hours prior to performing any utility excavation.

#### 1.6 EARTHWORK

- A. Earthwork shall conform to the provisions of Section 19, “Earthwork,” of the Standard Specifications, these Special Provisions, and the directions of the ENGINEER.
- B. Pursuant to State law regulations, all open excavations greater than five feet in depth shall be constructed with bracing, sheeting, shoring or other equivalent method designed for the protection of life and limb. The CONTRACTOR must at all times comply with the requirements of the construction safety orders of the Division of Industrial Safety, uniform Building Code, Cal-OSHA, and other governing codes and restrictions.
- C. The above-stipulated requirements shall be considered the minimum to be provided. It shall be the CONTRACTOR's responsibility to provide the additional strength required to support the sides of the excavation against loads which may exceed those employed to derive the criteria set forth in the Industrial Safety orders. The CONTRACTOR shall be solely responsible for any and all liabilities which may arise from his failure to provide adequate shoring, bracing or sheeting as necessary to support the excavation under any and all of the conditions of loading which may exist or which may arise during construction of the project.
- D. The CONTRACTOR shall assign a project safety supervisor who shall, by training and experience, be fully qualified to supervise the installation, maintenance and removal of sheeting, shoring and bracing. The project safety supervisor shall have full authority over the work in all job safety matters and shall be present at all times when work is in progress in excavations and trenches greater than five feet in depth.
- E. Should the ENGINEER determine that work be suspended for the Winter Season due to the CONTRACTOR not aggressively prosecuting the Project to completion within the stipulated time, the CONTRACTOR shall be responsible for “winterizing” the Project to the satisfaction of the ENGINEER, and maintaining said Project in a safe and acceptable manner, regardless of the amount of effort involved, all at the CONTRACTOR’s expense, and no additional compensation will be allowed therefore.
- F. “Winterizing” shall include the general maintenance of the Project site to a level that will not leave any detrimental effects for future construction, clean-up of material tracked from the Project limits, supplying and placing material to provide

and maintain access, necessary work to maintain existing drainage patterns, and all work necessary to comply with Section 7-1.08, “Public Convenience,” and Section 7-1.09, “Public Safety,” of the Standard Specifications, and Section 7-7, “Project Appearance,” of these Special Provisions.

## **PART 2 -- PRODUCTS**

### **2.1 SUITABLE BACKFILL MATERIALS**

- A. Suitable Backfill shall be a selected or processed clean, fine earth, rock, or sand, free from objectionable material, vegetation, or other deleterious substances.
- B. The following TYPES of backfill materials are designated and defined as follows:

TYPE 1. **Sand** shall be material with 100 percent passing a No. 4 sieve and less than 5% passing No. 200, and a sand equivalent value not less than 20. Sand material shall be free from organic matter and clay.

TYPE 2. **Class 2 Aggregate Base** shall be crushed rock aggregate base material meeting the requirements of Section 26, “Aggregate Bases,” for ¾” maximum grading, of the Caltrans Standard Specifications.

TYPE 3. **Class 1, Type A or B, Permeable Material** shall be crushed stone, or gravel, durable and free from slaking or decomposition under action or alternate wetting or drying, uniformly graded, and shall meet the requirements of Section 68-1.025 for Class 1, “Permeable Material,” of the Caltrans Standard Specifications.

TYPE 4. **Structural Backfill** shall be material with 100% passing a 3” sieve, 35-100% passing with a No.4 sieve, and 20-100% passing a No.30 sieve.

TYPE 5. **Native** material shall be material obtained from on-site excavations, provided the materials are not classified as unsuitable. Native material shall be free of stones, lumps, broken concrete or bituminous surfacing over 3 inches in three-way diameter, organic matter, objectionable material, vegetation, and deleterious substances.



TYPE 6. **Topsoil** material may be material which has been obtained at the site or may be imported, removal of the topsoil shall be done after the area has been stripped of vegetation and debris as specified.

## 2.2 UNSUITABLE BACKFILL MATERIAL

- A. Unsuitable soils for backfill material shall include soils which, when classified under ASTM D 2487, fall in the classifications of Pt, OH, or OL. Types CH and MH soils will be permitted in unimproved areas only where required compaction and stability can be demonstrated. In addition, any soil which cannot be compacted sufficiently to achieve the percentage of maximum density specified for the intended use, shall be classified as unsuitable material.
- B. Any material determined to be hazardous is defined as unsuitable material.
- C. Washed, smooth rock (pea gravel) is classified as unsuitable material.
- D. Where moisture content of the material is not in conformance with these Special Provision the material will be classified as unsuitable material.

## 2.3 USE OF SUITABLE BACKFILL MATERIAL TYPES

- A. The CONTRACTOR shall use the types of materials as designated herein for all required backfill construction.
- B. Backfill material types shall be used in conformance with the following provisions:
  - 1. **Bedding** backfill, as defined under PART 3 - EXECUTION of this Section herein, shall be Sand; meeting the requirements of Product Types 1 or 3A.
  - 2. **Pipe Zone** backfill, exclusive of bedding, as defined under PART 3 - EXECUTION of this Section herein, shall be as follows:
    - a. Plastic pipe shall be backfilled with Sand meeting the requirements of Product Type 1 or 3A.

3. **Trench Zone** backfill as defined under PART 3 - EXECUTION of this Section herein, shall meet the requirements of Product Types 4 Structural Backfill in Roadway/Sidewalk/Pathway and Type 5 Native backfill in Outside Roadway and Outside Pathway.
4. **Final Zone** backfill as defined under PART 3 - EXECUTION of this Section herein, shall consist of the following materials for each condition listed below.
  - a. Final Zone backfill under paved areas shall be Class 2 Aggregate Base, meeting the requirements of Product Types 2.
  - b. Final Zone Backfill in unimproved areas shall be Native meeting the requirements of Product Types 5.
  - c. Final Zone backfill in landscape areas shall be Native meeting the requirements of Product Type 5. Topsoil and amendments shall be Product Type 6.
  - d. Final Zone backfill under graveled roads shall be Class 2 Aggregate Base, or Native meeting the requirements of Product Types 2 or 5.
5. **Minor structures.** Backfill materials around minor structures (water valves & ect's) shall be any Trench Zone Product Type except Native meeting the requirement of Product Type 4.
6. **Over-excavation** backfill shall be Class 1, Type B Permeable Material meeting the requirements of Product Type 3B. For wet trench conditions place a filter fabric on top and below of the permeable material to prevent migration of fines.

## 2.4 FILTER FABRIC

- A. Filter fabric shall be non-woven synthetic fabric meeting the requirements of Section 88-1.03, "Filter Fabric," of the Caltrans Standard Specifications. Filter fabric shall be non-woven synthetic fabric with a minimum Grab Strength of 90 pounds; a minimum Burst Strength of

180 pounds, a minimum Puncture Strength of 50 pounds, a Water Flow Rate of at least 40 gal/min/sf, and an Apparent Opening Size of between 60 and 110.

## 2.5 STEEL PLATE

- A. When steel plate bridging is provided in-lieu of backfill and temporary asphalt, it shall conform to Section 602.1 of the Caltrans Encroachment Permit Manual, with the following minimum thicknesses:

Trench Width	Minimum Plate Thickness
(10") 0.25 m	(1/2") 13 mm
(1' - 11") 0.58 m	(3/4") 19 mm
(2' - 7") 0.80 m	(7/8") 22 mm
(3' - 5") 1.04 m	(1") 25 mm
(5' - 3") 1.60 m	(1 1/4") 32 mm

For spans greater than 5 feet-3 inches, a structural design shall be prepared by a California registered civil ENGINEER.

## PART 3 -- EXECUTION

### 3.1 GENERAL

- A. Where abandoned underground structures are encountered in the asphalt pathway, remove to sufficient depth to allow underground lines to cross, backfill and compact during rough grading. The ENGINEER may require further work to be done if visual inspection indicates during construction.

### 3.2 MINOR STRUCTURE EXCAVATION

- A. **General:** Except when specifically provided to the contrary, excavation shall include the removal of all materials of whatever nature encountered, including all obstructions of any nature that would interfere with the proper execution and completion of the work. The removal of said materials shall conform to the lines and grades shown on the Drawings or ordered by

the ENGINEER. Unless otherwise provided, the entire construction site shall be stripped of all vegetation and debris, and such material shall be removed from the site prior to performing any excavation or placing any fill. The CONTRACTOR shall furnish, place, and maintain all supports and shoring that may be required for the sides of the excavations, and all pumping, ditching, or other measures required for the removal or exclusion of water, including storm water, groundwater, and wastewater reaching the site of the work from any source so as to prevent damage to the work or adjoining property. Excavations shall be sloped or otherwise supported in a safe manner in accordance with applicable State safety requirements and the requirements of OSHA Safety and Health Standards for Construction (29CFR1926). The limits of structure excavation shall be a minimum of 12 inches beyond the outside edge of the structure, and at a minimum no larger than necessary to facilitate backfill, compaction and testing operations.

### 3.3 PIPELINE AND UTILITY TRENCH EXCAVATION

- A. **Trench Width:** Unless otherwise shown or directed, excavation for pipelines and utilities shall be open-cut trenches. Trench widths shall be kept as narrow as is practical for the method of densification selected by the CONTRACTOR, but shall have a minimum width at the bottom of the trench equal to the outside diameter of the pipe plus 12 inches. The maximum width at the top of the pipe shall be equal to the outside diameter of the 24 inches. For deep trenches, the maximum width requirement may be waived for constructability reasons with the written approval of the ENGINEER.
- B. **Subgrade:** The surface of the subgrade after compaction shall be hard, uniform, smooth, self-draining, and true to grade and cross section.
- C. **Trench Bottom:** The pipe bedding shall be given a final trim establishing grade such that each pipe section when first laid will be continually in contact with the bedding along the extreme bottom of the pipe. Rounding out the trench bottom or bedding to form a cradle for the pipe will not be allowed. The CONTRACTOR shall excavate for bell holes and fittings.
- D. **Open Trench:** The maximum amount of open trench permitted in any one location shall be the length necessary to accommodate the amount of pipe installed and backfilled in a single day. All trenches shall be fully backfilled at the end of each day or, in lieu thereof, shall be

covered by heavy steel plates adequately braced and capable of supporting vehicular traffic in those locations where it is impractical to backfill at the end of each day. The above requirements for backfilling or use of steel plate may be waived in cases where the trench is located further than 100 feet from any travelled roadway or occupied structure. In such cases, however, barricades and warning lights meeting safety requirements shall be provided and maintained.

- E. **Trench Over-Excavation:** Where indicated trenches shall be excavated to the depth shown, and then backfilled to the grade of the bottom of the Pipe Zone.
- F. **Over-Excavation:** When ordered by the ENGINEER, whether or not indicated on the Drawings, trenches shall be over-excavated beyond the depth shown. Such over-excavation shall be to the depth ordered. The trench shall then be backfilled to the grade of the bottom of the Pipe Zone.
- G. Where pipelines are to be installed in embankment or structure fills, the fill shall be constructed to a level a minimum of 2 feet above the top of the pipe, as directed by the ENGINEER, or as recommended by the pipe manufacturer, whichever is greater, before the trench is excavated.

### 3.4 OVER-EXCAVATION NOT ORDERED, SPECIFIED, OR SHOWN

- A. Any over-excavation carried below the grade ordered, specified, or shown, shall be backfilled to the required grade and densified with the specified material and compaction. Such work shall be performed by the CONTRACTOR at its own expense.

### 3.5 EXCAVATION IN VICINITY OF TREES

- A. Except where trees are shown to be removed, trees shall be protected from injury during construction operations. No tree roots over 2 inches in diameter shall be cut without express permission of the ENGINEER. Trees shall be supported during excavation by any means previously reviewed by the ENGINEER.
- B. If existing roots over one inch in diameter are cut during the course of the work, the cut faces shall be thoroughly coated with emulsified asphalt made especially for use on cut or damaged

plant tissues. Exposed roots shall be covered with wet burlap to prevent them from drying out.

### 3.6 ROCK EXCAVATION

- A. Rock excavation shall include removal and disposal of the following: (1) all boulders measuring 1/3 of a cubic yard or more in volume; (2) all rock material in ledges, bedding deposits, and unstratified masses; (3) concrete or masonry structures which have been abandoned; and (4) conglomerate deposits which are so firmly cemented that they possess the characteristics of solid rock.
- B. **Explosives and Blasting:** Use of Explosives and Blasting will not be permitted.

### 3.7 DISPOSAL OF EXCESS EXCAVATED MATERIAL

- A. The CONTRACTOR shall remove and dispose of all excess excavated material to a suitable site. The proper and legal disposal shall be the responsibility of the CONTRACTOR.

### 3.8 BACKFILL - GENERAL

- A. Backfill shall not be dropped directly upon any structure or pipe. Backfill shall not be placed around or upon any structure for a minimum of 72 hours or until the concrete has attained sufficient design strength to withstand the loads imposed, whichever is greater.
- B. Except for Product Type 3B material being placed in over-excavated areas or trenches and unless specifically excepted by the ENGINEER, backfill shall not be placed until after all water is removed from the excavation.

### 3.9 PIPE AND UTILITY TRENCH ZONES AND BACKFILL

#### A. **Pipe Zone and Backfill:**

- 1. The Pipe Zone is defined as that portion of the vertical trench cross-section lying between a plane 6 inches below the bottom surface of the pipe, i.e., the trench subgrade, and a plane at a point 12 inches above the top surface of the pipe.

2. The Pipe Zone shall be backfilled with the specified backfill material. The CONTRACTOR shall exercise care to prevent damage to the pipeline coating, cathodic bonds, or the pipe itself during the installation and backfill operations.

B. **Bedding:** The bedding is defined as that portion of the Pipe Zone lying between a plane 6 inches below the bottom surface of the pipe, the trench subgrade, and a level line from the bottom of the pipe.

1. Bedding shall be provided for all pipelines.
2. After compacting the bedding, the CONTRACTOR shall perform a final trim for establishing grade, such that each pipe section when first laid will be continually in contact with the bedding along the extreme bottom of the pipe.

C. **Trench Zone and Backfill:** After the Pipe Zone backfill has been placed as specified above, and after all excess water has completely drained from the trench, backfilling of the Trench Zone may proceed.

The Trench Zone is defined as that portion of the vertical trench cross-section lying between a plane 12 inches above the top surface of the pipe and a plane at a point 12 inches below the roadway subgrade in paved areas, or 12 inches below the finished surface grade in landscaped or unimproved areas.

D. **Final Zone and Backfill:** The Final Zone is defined as the last 12 inches between the top of the Trench Zone and the roadway subgrade in paved areas, and the last 12 inches of the vertical trench cross-section lying between the top of the Trench Zone and the finish final grade in landscaped or unimproved areas.

E. **Utility Crossing:** For any new pipeline installation that crosses under an existing electric, gas, telephone, or cable tv utility pipe(s) or conduit(s) the CONTRACTOR shall replace the existing backfill material around the existing utility pipe(s) or conduit(s) with SAND. SAND shall be placed from a plane 6 inches below the bottom of the lowest utility pipe or conduit to a plane 12 inches above the top of the highest utility pipe or conduit, and for the full width of

the new trench. PG&E SAND backfill shall be compacted to 95 percent maximum density in conformance with COMPACTION AND BACKFILL MATERIALS as specified below.

### 3.10 PLACING AND SPREADING OF BACKFILL MATERIALS

- A. Backfill materials shall be placed and spread evenly in horizontal layers. The backfill layers shall be evenly spread so that when compacted, each layer shall not exceed 8 inches in thickness for pipe zone backfill and 12" thickness for in trench zone backfill.
- B. During spreading each layer shall be thoroughly mixed as necessary to promote uniformity of material in each layer and uniformity of moisture throughout backfill materials. Pipe Zone backfill materials shall be manually spread around the pipe so that when compacted, the Pipe Zone backfill will provide uniform bearing and side support.
- C. Where the backfill material moisture content is below the optimum moisture content water shall be added before or during spreading until the proper moisture content is achieved.
- D. Where the backfill material moisture content is too high to permit the specified degree of compaction, the material shall be dried or replaced until the moisture content is satisfactory.
- E. Backfill shall be mechanically compacted by means of tamping rollers, sheepfoot rollers, pneumatic tire roller, vibrating rollers, or other mechanical tampers. All such equipment shall be of a size and type subject to review by the ENGINEER. Impact-type pavement breakers (stompers) will not be permitted. Permission to use specific compaction equipment shall not be construed as guaranteeing or implying that the use of such equipment will not result in damage to adjacent ground, existing improvements, or new improvements. The CONTRACTOR shall make its own determination in this regard.
- F. Material for mechanically compacted backfill may be placed in loose lifts which, prior to compaction, shall not exceed the thickness specified below for various types of equipment:
  - 1. Vibratory equipment, including vibratory plates, vibratory smooth-wheel rollers, and vibratory pneumatic-tired rollers - maximum lift thickness of 8" in pipe zone backfill and 12" in trench zone.



2. Rolling equipment, including sheepsfoot (both vibratory and non-vibratory), grid, smooth-wheel (non-vibratory), pneumatic-tired (non-vibratory), and segmented wheels - maximum lift thickness of 8" in pipe zone backfill and 12" in trench zone.
3. Hand-directed mechanical tampers-maximum lift thickness of 4 inches.

G. Mechanically compacted landfill shall be placed in horizontal layers of thickness not exceeding those specified above, compatible to the material being placed and the type of equipment being used. Each layer shall be evenly spread, moistened or dried, if necessary, and then tamped or rolled until the specified relative compaction has been attained.

### 3.11 COMPACTION OF BACKFILL MATERIALS

- A. Each layer of backfill material as defined herein, shall be mechanically compacted to the specified percentage of maximum density. Equipment that is consistently capable of achieving the required degree of compaction shall be used and each layer shall be compacted over its entire area while the material is at the required moisture content range.
- B. Flooding, ponding, or jetting shall not be used.
- C. Equipment weighing more than 10,000 pounds shall not be used closer to structure walls than a horizontal distance equal to the depth of the fill against the structure wall at that time. Hand operated power compaction equipment shall be used where use of heavier equipment is impractical or restricted due to weight limitations.
- D. **Compaction Requirements:** The following compaction test requirements shall be in accordance with ASTM D 1557 for cohesive type materials and in accordance with ASTM D 4253 and D 4254 for "non-plastic" cohesionless free draining granular type materials. Where other agency or utility company requirements govern, the highest compaction standards shall apply.

<u>Location or Use of Fill</u>	<u>Percentage of Maximum Density</u>
Pipe Zone backfill including bedding and overexcavated zone.	95

Final Zone backfill beneath paved areas or structures.	95
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Final Zone backfill beneath unpaved access areas, landscape, or unimproved areas.	90
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Trench Zone backfill.	95
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Backfill beneath minor structures.	95
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Backfill around minor structures.	90
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Maximum Density refers to maximum dry density according to ASTM D 1557 laboratory test procedures. Percentage of Relative Density refers to ASTM D 4253 and ASTM D 4254 laboratory test procedures. Relative density should only be used for "non-plastic" cohesionless free draining, granular-type materials.

E. **Trench Backfill Requirements:** The pipe class has been structurally designed based upon the trench configuration previously specified herein.

1. The CONTRACTOR shall maintain the previously specified trench width up to a horizontal plane lying 12 inches above the top of the pipe.
2. If, at any location under said horizontal plane, the CONTRACTOR slopes the trench walls or exceeds the maximum trench widths indicated the Pipe Zone backfill shall be "improved" or the pipe class improved at no additional cost to the RCD. "Improved" backfill shall mean Control Low Strength Materials or other equivalent materials acceptable to the ENGINEER.
3. If the allowable deflection specified for the pipe is exceeded, the CONTRACTOR shall expose and reround or replace the pipe, repair all damaged lining and coating, and reinstall the Pipe Zone material and Trench Zone backfill as specified.

4. All trenches shall have a minimum of 2 inches of temporary asphalt placed daily and maintained unless final paving can be completed in the same day. Temporary asphalt shall be placed flush with adjacent pavement grade.

Steel plates may be used to cover open trenches in-lieu of backfill and temporary asphalt pavement.

### 3.12 STEEL PLATE

- A. **General:** When backfilling operations of an excavation in the traveled way, whether transverse or longitudinal, cannot be properly completed within a work day, steel plate bridging with a non-skid surface and shoring may be required to preserve unobstructed traffic flow.
- B. When steel plate bridging is required, the following conditions shall apply:
  1. Steel plates used for bridging must extend a minimum of 12 inches beyond the edges of the trench.
  2. Steel plate bridging shall be installed to operate with minimum noise.
  3. The trench shall be adequately shored to support the bridging and traffic loads.
  4. Temporary paving with cold asphalt concrete shall be used to feather the edges of the plates, if plate installation by Method (2) is used.
  5. Bridging shall be secured against displacement by using adjustable cleats, shims or other devices.
- C. Steel plate bridging and shoring shall be installed using either Method (1) or (2):
  1. Method 1 For speeds more than 45 mph:

N/A

2. Method 2 For speeds 45 mph or less:

Approaching plate(s) and ending plate (if longitudinal placement) shall be attached to the roadway by a minimum of 2 dowels pre-drilled into the corners of the plate and drilled 2 inches into the pavement. Subsequent plates are butted to each other. Fine graded asphalt concrete shall be compacted to form ramps, maximum slope 8.5 percent with a minimum 12-inch taper to cover all edges of the steel plates. When steel plates are removed, the dowel holes in the pavement shall be backfilled with either graded fines of asphalt concrete mix, concrete slurry or an equivalent slurry.

D. Steel plate bridging should not exceed 4 consecutive working days in any given week.

#### **PART 4 - PAYMENT**

Full compensation for conforming to the requirements of this section shall be considered as included in the unit prices paid for the various Contract items of work, and no additional compensation will be allowed therefor.

#### **END OF SECTION**

## **SECTION 108.**

### **HORIZONTAL DIRECTIONAL DRILLING**

#### **PART 1 – GENERAL**

##### **1.1 THE REQUIREMENT**

- A. The work specified in this section consists of furnishing and installing underground utilities using the horizontal directional drilling (HDD) method of installation, also commonly referred to as directional boring or guided horizontal boring. The CONTRACTOR is responsible for all work related to the provision of utilities installed, including assessing surface, subsurface, and environmental (seasonal) conditions. This work shall include all services, equipment, materials, and labor for the complete and proper installation, testing, restoration of underground utilities and environmental protection and restoration.

##### **1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

- A. High Density Polyethylene (HDPE) Pipe and Fittings shall be used as a reference.

##### **1.3 CONTRACTOR SUBMITTALS**

###### **A. WORKPLAN**

Prior to beginning work, the CONTRACTOR must submit to the ENGINEER a general work plan outlining the procedure and schedule to be used to execute the project. Plan should document the thoughtful planning required to successfully complete the project.

###### **B. EQUIPMENT**

CONTRACTOR will submit specifications on directional drilling equipment to be used to ensure that the equipment will be adequate to complete the project.

###### **C. MATERIALS**

Specifications on material to be used shall be submitted to ENGINEER. Material shall include the pipe, fittings and any other item which is to be an installed component of the project.

##### **1.5 QUALITY ASSURANCE**

The requirements set forth in this document specify a wide range of procedural precautions

necessary to ensure that the very basic, essential aspects of a proper directional bore installation are adequately controlled. Strict adherence shall be required under specifically covered conditions outlined in this specification. Adherence to the specifications contained herein, or the ENGINEER's approval of any aspect of any directional bore operation covered by this specification, shall in no way relieve the CONTRACTOR of their ultimate responsibility for the satisfactory completion of the work authorized under the Contract.

## **PART 2 – EQUIPMENT REQUIREMENTS**

### **2.1 EQUIPMENT**

The directional drilling equipment shall consist of a directional drilling rig of sufficient capacity to perform the bore and pullback the pipe, a drilling fluid mixing & delivery system of sufficient capacity to successfully complete the crossing, a guidance system to accurately guide boring operations and trained and competent personnel to operate the system. All equipment shall be in good, safe operating condition with sufficient supplies, materials and spare parts on hand to maintain the system in good working order for the duration of this project.

Include in directional drilling equipment machine a common grounding system to prevent electrical shock in the event of underground electrical cable strike. Ensure the grounding system connects all pieces of interconnecting machinery; the drill, mud mixing system, drill power unit, drill rod trailer, operator's booth, worker grounding mats, and any other interconnected equipment to a common ground. Equip the drill with an "electrical strike" audible and visual warning system that notifies the system operators of an electrical strike.

### **2.2 DRILLING SYSTEM**

#### **A. DRILLING RIG**

The directional drilling machine shall consist of a hydraulically powered system to rotate, push and pull hollow drill pipe into the ground at a variable angle while delivering a pressurized fluid mixture to a guidable drill (bore) head. The machine shall be anchored to the ground to withstand the pulling, pushing and rotating pressure required to complete the crossing. The hydraulic power system shall be self-contained with sufficient pressure and volume to power drilling operations. Hydraulic system shall be free of leaks. Rig shall have a system to monitor and record maximum pull-back pressure during pull-back operations.

#### **B. DRILL HEAD**

The drill head shall be steerable by changing its rotation and shall provide the necessary cutting surfaces and drilling fluid jets.

C. MUD MOTORS (if required)

Mud motors shall be of adequate power to turn the required drilling tools.

D. DRILL PIPE

Shall be constructed of high quality 4130 seamless tubing, grade D or better, with threaded box and pins. Tool joints should be hardened to 32-36 RC.

2.3 GUIDANCE SYSTEM

The Guidance System shall be of a proven type and shall be setup and operated by personnel trained and experienced with this system. The Operator shall be aware of any magnetic anomalies and shall consider such influences in the operation of the guidance system if using a magnetic system.

2.4 DRILLING FLUID (MUD) SYSTEM

A. MIXING SYSTEM

A self-contained, closed, drilling fluid mixing system shall be of sufficient size to mix and deliver drilling fluid composed of bentonite clay, potable water and appropriate additives. Mixing system shall be able to molecularly shear individual bentonite particles from the dry powder to avoid clumping and ensure thorough mixing. The drilling fluid reservoir tank shall be sized for adequate storage of the mud. Mixing system shall continually agitate the drilling fluid during drilling operations.

B. DRILLING FLUIDS

Drilling fluid shall be composed of clean water and an appropriate additive. Water shall be from a clean source with a pH of 8.5 – 10 and/or as per mixing requirements of the Manufacturer. Water of a lower pH or with excessive calcium shall be treated with the appropriate amount of sodium carbonate or equal. The water and additives shall be mixed thoroughly and be absent of any clumps or clods. No hazardous additives may be used. Drilling fluid shall be maintained at a viscosity sufficient to suspend cuttings and maintain the integrity of bore wall.

C. DELIVERY SYSTEM

The mud pumping system shall have a minimum capacity to supply mud in accordance with the drilling equipment pull-back rating at a constant required pressure. The delivery system shall have filters in-line to prevent solids from being pumped into the drill pipe. Connections between the pump and drill pipe shall be relatively leak-free. Used drilling fluid and drilling fluid spilled during drilling operations shall be contained and properly disposed of. A berm, minimum of 12" high, shall be maintained around drill rigs, drilling fluid mixing system, entry and exit pits and drilling fluid recycling system (if used) to prevent spills into the surrounding environment. Pumps and or vacuum truck(s) of sufficient size shall be in place to convey excess drilling fluid from containment areas to storage facilities.

## 2.5 OTHER EQUIPMENT

### A. PIPE ROLLERS

Pipe rollers, if required, shall be of sufficient size to fully support the weight of the pipe while being hydro-tested and during pull-back operations. Sufficient number of rollers shall be used to prevent excess sagging of pipe.

### B. PIPE RAMMERS

Hydraulic or pneumatic pipe rammers may only be used if necessary and with the authorization of ENGINEER.

### C. RESTRICTIONS

Other devices or utility placement systems for providing horizontal thrust other than those previously defined in the preceding sections shall not be used unless approved by the ENGINEER prior to commencement of the work. Consideration for approval will be made on an individual basis for each specified location. The proposed device or system will be evaluated prior to approval or rejection on its potential ability to complete the utility placement satisfactorily without undue stoppage and to maintain line and grade within the tolerances prescribed by the particular conditions of the project.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

Ensure all utilities are located and clearly marked prior to start of excavation or drilling. Design and construct the drill entrance and exit pits.



The Engineer must be notified 48 hours in advance of starting work. Drilling shall not begin until the Engineer is present at the job site and agrees that proper preparations for the operation have been made. The Engineer approval for beginning the installation shall in no way relieve the CONTRACTOR of the ultimate responsibility for the satisfactory completion of the work as authorized under the Contract. It shall be the responsibility of Engineer to provide inspection personnel at such times as appropriate without causing undue hardship by reason of delay to the CONTRACTOR.

**A. DRILLING FLUIDS**

Mix the drilling fluid with potable water (of proper pH) to ensure no contamination is introduced into the soil during the drilling, reaming, or pipe installation process. Make any required pH adjustments.

**B. DRILL ENTRANCE AND EXIT PITS**

Drill entrance and exit pits are required. Maintain at minimum size to allow only the minimum amount of drilling fluid storage prior to transfer to mud recycling or processing system or removal from the site. Do not allow drilling mud to flow freely on the site or around the entrance or exit pits. Remove spilled mud and restore ground to original condition.

Drilling near wetlands or water courses requires secondary containment to prevent drilling fluids from entering the wetlands. Secure written approval of a secondary containment plan from the ENGINEER.

**C. DRILL ENTRANCE AND EXIT ANGLE**

Ensure entrance and exit angles and elevation profile maintains adequate cover to reduce risk of drilling fluid breakouts and ground exit occurs as specified herein. Ensure that entrance and exit angles generate pullback forces that do not exceed 5 percent strain on the polyethylene pipe.

**D. PILOT HOLE**

The type and size of the pilot string cutting head and the diameter of the drill pipe is at the CONTRACTOR's discretion. Drill the pilot hole along the path shown on the plan and profile drawings. Pilot hole tolerances are as follows:

- a. Vertical Tolerance: Provide minimum cover as specified on the plans. Pilot hole may go deeper if necessary to prevent breakout.

- b. Horizontal Tolerance: Plus/minus 60-inches from the centerline of the product pipe.
- c. Curve Radius: No curve is acceptable with a radius less than 45-feet
- d. Entry Point Location: Make pilot hole entry point within plus/minus 60-inches of the location shown on the drawings or as directed by the ENGINEER in the field.
- e. Exit Point Location: Make the exit point location within plus/minus 60-inches of the location shown on the drawings or as directed by the ENGINEER in the field.
- f. Mandatory pipeline cover requirements are as shown on the drawings or as specified.

#### E. REAMING

Conduct reaming operations at the CONTRACTOR's discretion. Determine the type of back reamer to be utilized by the type of subsurface soil conditions that are encountered during the pilot hole drilling operation. The reamer type is at the CONTRACTOR's discretion.

#### F. PULL BACK

Assemble the pipeline to be installed via direction drill prior to commencement of pull back operations. Support the pipeline during pullback operations in a manner to enable it to move freely and prevent damage. Install the pipeline in one continuous pull. Minimize torsion stress by using a swivel to connect the pull section to the reaming assembly.

Maximum allowable tensile force imposed on the pull section is not to exceed 90 percent of the pipe manufacturer's safe pull (or tensile) strength. If the pull section is made up of multiple pipe size or materials, the lowest safe pull strength value governs and the maximum allowable tensile force is not to exceed 90 percent of this value.

Minimize external pressure during installation of the pullback section in the reamed hole. Replace damaged pipe resulting from external pressure at no cost to the RCD. Buoyancy modification is at the discretion of the CONTRACTOR.

#### G. DRILLING FLUIDS DISPOSAL

Collect drilling fluid returns in the entrance pit, exit pit, or spoils recovery pit. Immediately clean up any drilling fluid spills or overflows from these pits. Dispose of fluids in a manner that it complies with all permits and applicable Federal, State, and local regulations. Disposal of the drilling fluids may occur on approved land owned by the RCD subject to written approval from

the ENGINEER. Spread the drilling slurry over the RCD-approved disposal area and plow into the soil. Conduct disposal in compliance with all relative environmental regulations, right-of-way and work space agreements, and permit requirements.

#### H. CONNECTION OF PRODUCT PIPE TO PIPELINE

After the product pipe has been successfully installed, allow the product pipe to recover for 24 hours prior to connection of the pipeline. Ensure that a sufficient length of the product pipe has been pulled through the hole so that the pull-nose is not pulled back into bore hole due to stretch recovery of the product pipe.

### 3.2 FIELD QUALITY CONTROL

Maintain drilling logs that accurately provide drill bit location (both horizontally and vertically) at least every 2-inches along the drill path. In addition, keep logs that record, as a minimum the following, every 15 minutes throughout each drill pass, back ream pass, or pipe installation pass:

- a. Drilling Fluid Pressure
- b. Drilling Fluid Flow Rate
- c. Drill Thrust Pressure
- d. Drill Pullback Pressure
- e. Drill Head Torque

Make all instrumentation, readings, and logs available to the ENGINEER at all times during operation.

### 3.3 CLOSEOUT ACTIVITIES

Immediately upon completion of work, remove all rubbish and debris from the job site. Remove all construction equipment and implements of service leaving the entire area involved in a neat condition acceptable of the ENGINEER.

Immediately clean "blow holes" or "breakouts" of drilling fluid to the surface and return the surface area to its original condition. Dispose of all drilling fluids, soils, and separated materials in compliance with Federal, State, and local environmental regulations.

Submit an electronic copy and three hard copies of the record drawings to the ENGINEER within

five days after completing the pull back. Include in the record drawings a plan, profile, and all information recorded during the progress of the work. Clearly tie the record drawings to the project's survey control. Maintain and submit upon completion signed complete work logs of guided directional drill operations.

#### **PART 4 - PAYMENT**

The Contract lump sum price paid for this item shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work required by these Special Provisions, including submittals, in a form approved by the ENGINEER, as specified in these Special Provisions, the Standard Specifications and as directed by the ENGINEER, and no additional compensation will be allowed therefore.

#### **END SECTION**

**SECTION 109.**  
**HIGH-DENSITY POLYETHYLENE PIPE**

**PART 1 – GENERAL**

**1.1 THE REQUIREMENT**

- A. The CONTRACTOR shall provide all materials, equipment, and labor necessary to furnish and install high-density polyethylene (HDPE) pipe, and all appurtenant work, complete and operable, including all connections as shown on the Drawings and as specified herein.

**1.2 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 103                                      Miscellaneous Piping, Valves, Fittings, and Appurtenances.
- B. Section 104                                      Pressure Pipeline Testing and Disinfection.
- C. Section 108                                      Horizontal Directional Drilling

**1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

**A. Commercial Standards:**

- California Regulations Related to Drinking Water (July 1, 2013)-Section 64572, California Waterworks Standards, Title 22 California Code of Regulations (CCR)
- AASHTO, Standard for Highway Bridges.
- ASTM D 638 Test Method for Tensile Properties of Plastics
- ASTM D 696 Test Method for Coefficient of Linear Thermal Expansion of Plastics
- ASTM D 746 Test Method for Brittleness Temperature of Plastics and Elastomers by Impact
- ASTM D 1238 Test Method for Flow Rates of Thermoplastics by Extrusion Plastometer
- ASTM D 1248 Specification for Polyethylene Plastics Molding and Extrusion Materials
- ASTM D 1505 Test Method for Density of Plastics by the Density-Gradient Technique
- ASTM D 1525 Test Method for Vicat Softening Temperature of Plastics
- ASTM D 1603 Test Method for Carbon Black in Olefin Plastics
- ASTM D 1693 Test Method for Environmental Stress-Cracking of Ethylene Plastics

- ASTM D 1928 Test Method for Preparation of Compression-Molded Polyethylene
- ASTM D 2240 Test Method for Rubber Property- Durometer Hardness
- ASTM D 2657 Practice for Heat Joining of Polyolefin Pipe and Fittings
- ASTM D 2837 Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials
- ASTM D 3261 Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing
- ASTM D 3350 Specification for Polyethylene Plastic Pipes and Fittings Materials
- Test Sheets and Test Specimens
- CAL OSHA

#### 1.4 CONTRACTOR SUBMITTALS

- A. The CONTRACTOR shall furnish documents to the ENGINEER certifying that the pipe furnished hereunder complies with the requirements described in this document.
- B. Submit a list of pipe and fittings to be used, which includes the following information where applicable:
  - Pipe and fittings to be used
  - Manufacturer
  - Model number, if applicable
  - Size and Sizing System
  - Materials
  - Pressure rating
  - Catalog data
  - Pipe joining methods and equipment, including specific procedures for fusion welding (pipe end cleaning, facing, joining, control of heating plate operation, documentation of jointing, debearing, etc.).
- C. Design of in-line anchors at terminus (each end) of HDPE pipe as it connects to existing waterline infrastructure.

#### 1.5 QUALITY ASSURANCE

- A. Tests: Except as modified herein, all materials used in the manufacture of the pipe shall be tested in accordance with the requirements of this Section, and as specified in the referenced

standards, as applicable.

- B. The CONTRACTOR shall have said material tests performance at no additional costs to the RCD. The ENGINEER shall have the right to witness all testing provided, that the CONTRACTOR'S schedule is not delayed for the convenience of the ENGINEER.
- C. In addition to those tests specifically required, the ENGINEER may request additional samples of any material for testing by the RCD. The additional samples shall be furnished at no additional cost to the RCD.

## **PART 2 -- PRODUCTS**

### **2.1 GENERAL**

- A. Referenced pipe sizes are nominal pipe diameters.
- B. All materials delivered to the job site shall be new, free from defects, and marked to identify manufacturer, material, class, and other appropriate information.
- C. The CONTRACTOR shall provide polyethylene pipe as specified. The pipe shall be made to diameter and tolerances in accordance with ASTM D3035. All pipe shall be made from virgin grade material. The pipe shall be of the diameter and class shown or specified and shall be furnished complete with all fabricated fittings, flanged joints and other appurtenances as necessary for a complete and functional system.
- D. Acceptance of materials will be subject to strength and quality testing, in addition to inspection of the completed product. Acceptance of installed piping system will be based on inspection and leakage tests.

### **2.2 PIPE**

- A. Pipe and fittings shall be high density, high molecular weight polyethylene, as defined in ASTM D 3350 and shall be colored black. In addition, the material shall be listed by the Plastic Pipe Institute with a designation of PE3408/PE3608, or Minimum Cell Classification 345464C (per ASTM D 3350), or approved equivalent. The pipe and fittings shall be DR 11 or as approved by the ENGINEER, with a minimum working pressure rating of 160 psi at 73.4°F.

- B. Fittings shall be of the same material and class as the pipe. Identification of pipe and fittings shall be in accordance with ASTM D 3350. Pipe and fittings shall be made from virgin material. No rework compound, except that obtained from the manufacturer's own production of the same formulation, shall be used. Pipe and fittings shall be homogeneous throughout and shall be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.

## 2.4 JOINTS

- A. Joints in HDPE pipe shall be made using thermal butt-fusion welding equipment designed for the specific purpose of permanently connecting HDPE pipes. This equipment shall be capable of squarely facing the pipe ends to be joined, properly heating each pipe end to the temperature range specified by the pipe manufacturer, and applying and sustaining the appropriate pressure, as recommended by the pipe manufacturer.
- B. The butt-fusion welding machine shall be outfitted with a measuring and recording unit that documents the conditions existing during the fusion of each individual weld. A printout that includes the date and time each joint was made, the joint number, the initials of the machine operator, the platen temperature at the time of mating, the pressure during the heating cycle, the time period for the heating cycle, the pressure during the soak cycle, and the time period of the soak cycle shall be machine-generated and delivered to the ENGINEER at the end of each work shift. The recording unit shall be a DataLogger, as manufactured by McElroy Manufacturing, Inc., or approved equal.
- C. Fusion equipment shall be operated by technicians who have been certified by a major gas public utility such as Pacific Gas and Electric or Southern California-Edison for operation of such equipment. Furthermore, all technicians performing butt-fusion welding on this project shall have a minimum of two (2) years' experience operating the same equipment used hereon.
- D. Butt-fusion welding equipment shall be as follows, or approved equal:
  - 1. McElroy No. 412 Hydraulic Fusion Machine, McElroy Manufacturing, Tulsa, Oklahoma
  - 2. Proweld Field 12 (315)-R, Asahi/America, Malden, Massachusetts

## 2.5 FITTINGS



- A. The CONTRACTOR shall provide fabricated fittings where required. Fabricated fittings shall be of the same material as, and shall have a minimum pressure rating equal to, the pipeline material. If the fitting is in-line with the pipeline (i.e., a flange adapter), then the I.D. of the fitting shall be the same as the pipe. If the fitting is off-line (i.e. a tee), then the fitting shall have an J.D. as directed by the ENGINEER. Unless otherwise required, all fittings shall be butt-fusion welded.
- B. Terminations to pipe or fittings made of other pipe materials shall be made by using flanges. Flanges shall consist of flange adapters butt-fusion welded to the HDPE pipe end, ductile iron back-up rings with a pressure rating of at least 150 pounds, Type 316 stainless steel bolts, nuts, and washers, and 118 inch-thick, black-reinforced rubber gaskets. In no case shall threaded fittings or adapters be used to connect plastic materials.

### **PART 3 – EXECUTION**

#### **3.1 HANDLING AND STORAGE**

- A. All pipe, fittings, etc., shall be carefully handled and protected against damage, impact shock, free fall, and scoring. All pipe handling equipment shall be acceptable to the ENGINEER. Pipe shall be stored in a manner that protects the pipe against injury or damage. Stacking of polyethylene pipe will not be allowed.
- B. The CONTRACTOR shall inspect each pipe and fitting prior to butt-fusion welding and again prior to installation. Any damaged pipe or fittings shall be repaired or replaced by the CONTRACTOR, at no additional expense to the RCD and to the satisfaction of the ENGINEER. Damage shall include, but not be limited to, gouges, cuts, or scratches of a depth greater than five percent (5%) of the pipe wall.
- C. Prior to butt-fusion welding or installation, each pipe or fitting shall be thoroughly cleaned of any foreign substance that may have collected thereon and shall be kept clean at all times thereafter. The material used to clean the pipe and fittings shall be as recommended by the pipe manufacturer.

#### **3.2 BUTT FUSION WELDING**

A. Only technicians who have been certified in accordance with the requirements of these Special Provisions shall be allowed to operate the butt-fusion welding equipment.

B. Butt-fusion welds shall be performed in accordance with manufacturer's instructions.

The butt-fusion welding procedures are summarized below:

- Clean each pipe end with a clean cotton cloth to remove dirt, oil, grease, and other foreign materials.
- Square (face) the mating surfaces of each of the pipes to be fused.
- Bring the two (2) pipe ends together and adjust the pipe locations to ensure proper alignment.
- Verify that the surface temperature of the heater plate is between 375 and 400 °F and then clean the heater surface with a clean cotton cloth.
- Insert the heater plate between the pipe ends, bring the ends into firm contact with the heater plate without applying pressure, and achieve a proper melt pattern.
- After achieving the proper melt bead, remove the heater plate and quickly examine the pipe ends for complete melt.
- Once complete melt has been accomplished, rapidly bring the pipe ends together and apply pressure as recommended by the pipe manufacturer.
- Hold the pressure constant and at the proper level throughout the cooling period, for the minimum time period recommended by the pipe manufacturer or as necessary to achieve proper cooling.

C. The CONTRACTOR shall mark each joint with the individual joint number, corresponding to the joint identification number appearing on the printout of the data logger attached to the butt-fusion welding machine. The printout shall be attached to the pipe near the joint for collection by the ENGINEER.

D. The CONTRACTOR shall remove the internal melt bead from the welded joint. Bead removal shall be accomplished in a manner that does not score or gouge the pipe.

### 3.3 INSTALLATION

- A. HDPE pipe shall be used for directional drilling or pipe bursting applications only, unless indicated otherwise in the Special Provisions or approved by the ENGINEER. The CONTRACTOR shall insert the pipe into the horizontal boring through properly prepared insertion and receiving pits, in accordance with the requirements of ASTM F 585.
- B. The maximum pulling force that may be applied to any pipe shall be calculated as follows:

$$F=SA$$

where: F = maximum pulling force on pipe (lb.)

S =maximum allowable stress (1,000 psi)

A= cross-sectional area of pipe wall (square inches)

The cross-sectional area of the pipe wall shall be calculated as follows:

$$A= (D-t)t$$

where: D = outside diameter (in)

t =minimum wall thickness (in)

- C. The CONTRACTOR shall take care not to drag the pipe over rocks or rough surfaces that may damage the pipe. An appropriate pulling head shall be attached to the end of the pipe and shall be used for pulling the pipe at all times. Pulling the pipe by the flanged end will not be allowed.
- D. Following installation, the insertion and receiving pits, and any other excavations used, shall be backfilled in accordance with these Special Provisions.

### 3.3 FIELD COUPLINGS

Fittings/Joints that are to be assembled after pipe bursting or directional drilling has been completed shall be butt fused where accessible. The electrofusion couplings shall be used on inaccessible locations. Electrofusion couplings shall be Frialen Electrofusion couplings, as manufactured by Friatec, Inc., or approved equal.

### 3.4 IN-LINE ANCHORING

When HDPE pipe is connected to existing (potentially unrestrained) existing waterline (i.e. galvanized pipe, bell and spigot, etc.), an in-line anchor shall be installed to mitigate Poisson Effects. The in-line anchor shall be designed by the CONTRACTOR. Approved designs shall be installed by the CONTRACTOR at each end of the installed HDPE water line. Installation of the in-line anchor shall be observed by the ENGINEER.

### 3.5 ISOLATION VALVES

Isolation valves shall be installed at each end of the HDPE waterline. The valves shall be located on the 'upstream side' of the in-line anchor and 'downstream side' of the existing waterline.

### 3.6 FILLING

The pipeline should be filled slowly, "limiting the flow to low velocities that prevent surges and air entrapment. Install temporary valves at high points to expel air during filling. Loosening flanges or connections to bleed air from the system is prohibited. The critical filling rate for pipes with air vents is usually based on 5 to 15 percent of the pipe design flow. For air valves, the filling rate is limited by orifice size and the fact that the seat will blow shut when air passing through the valve reaches sonic velocity. The maximum filling velocity in the pipeline should never exceed the design velocity.

### 3.7 LEAK TESTING

Leak testing with water shall be conducted after joining is complete and before pulling the pipe in the trench. NOTE: Testing of PE pipe outside of the trench prior to installation is dangerous. Ensure that the pipeline has been blocked to prevent movement in case of joint rupture and that there are no persons near the pipe while the pipe is pressurized.

Before pressure is applied, the pipeline section under test should be restrained against movement. Failure during pressurization can be sudden and violent. Leak tests should be conducted in accordance with ASTM F2164. A pressure of 1.5 times the design working pressure at the lowest point in the test section is used as the test pressure. The leak test duration shall be 6 hours. During the initial expansion phase, the expansion of the PE pipe will likely be logarithmic. However, after the initial four-hour period of pressurization at 1.5 times the hydrostatic design stress (HDS), the

pipe expansion becomes more linear. If the test is not completed because of leakage, equipment failure, or any other reason within this total time, the test section should be depressurized and allowed to "relax" for at least eight hours before starting the next testing sequence.

Correctly made fusion joints do not leak. If leakage is observed at a fusion joint, complete rupture may be imminent. Immediately move all persons away from the joint and depressurize the pipeline. Any joints showing leakage must be repaired and the system retested. Faulty fusion joints must be removed and remade.

Acceptance criteria. If the pressure remains steady (within 5 percent of the target value) for one hour (following the initial 4-hour 'seating' period), leakage is not indicated.

The following records shall be noted for the leak test and submitted to the ENGINEER within 48 hours of completion of leak test:

1. Test medium (normally water)
2. Test pressure
3. Test duration
4. Test data
5. Pressure recording chart or pressure log
6. Pressure versus makeup water added chart
7. Pressure at high and low elevations
8. Elevation at point test pressure is measured
9. Ambient temperature and weather conditions
10. Description of the test section length, location, and components
11. Description of any leaks, failures, and their repair/disposition.
12. Person or contractor conducting the test
13. Test times and dates

### 3.8 FLUSHING

To prevent damage to valves or other fittings from any foreign material left in the pipeline, the pipe should be thoroughly flushed prior to testing. A minimum velocity of 3 ft/sec is suggested. The initial flushing should be continued until the discharge appears clean; however, the minimum duration should be based on three "changes" of pipeline volume.

### 3.9 DISINFECTION

Disinfection of the HDPE water lines installed shall conform to the requirements of Section 104 “Pressure Pipeline Testing and Disinfection.”

#### **PART 4 - PAYMENT**

The contract lump sum price paid for installation of HDPE pipe shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work as shown on the plans, as specified in the Standard Specification and described in these Special Provisions, and as directed by the ENGINEER.

#### **END SECTION**

## **SECTION 110.**

### **TEMPORARY FENCE**

Temporary fences shall conform to the specifications for permanent fences of similar character provided in Section 80, "Fences," of the Standard Specifications, these Special Provisions, the Plans, and to the directions of the ENGINEER.

**A temporary fence shall be provided and installed by the CONTRACTOR to secure the area to the satisfaction of the ENGINEER. For estimating purposes only, assume 600 feet of temporary fence.**

Temporary fence herein is provided for estimating purposes only, and the RCD makes no guarantee as to the actual quantity of temporary fence.

Other than new materials may be used, providing such materials are good, sound, and are suitable for the purpose intended. Materials may be commercial quality providing the dimensions and sizes of said materials are equal to, or greater than, the dimensions and sizes shown on the Plans or specified by the specifications.

Galvanizing and painting of steel items will not be required. Concrete footings for metal posts will not be required. Temporary fences that are damaged from any cause during the progress of the work shall be repaired or replaced by the CONTRACTOR at his expense, and no additional compensation will be allowed therefor.

If, in the opinion of the ENGINEER, the CONTRACTOR appears negligent in preventing encroachment into the "secured area," the ENGINEER will direct the CONTRACTOR's attention to the situation, and require that necessary corrective action be taken. If the CONTRACTOR fails to correct the situation to the satisfaction of the ENGINEER, the ENGINEER may have the work done and deduct the cost of such work from monies due to the CONTRACTOR.

When no longer required for the work, as determined by the ENGINEER, temporary fences shall be removed by the CONTRACTOR. Removed facilities shall become the property of the CONTRACTOR and shall be removed from the site of the work, except as otherwise provided in this Section.

Holes caused by the removal of temporary fences shall be backfilled in accordance with the provisions in the second paragraph of Section 15-1.02, "Preservation of Property," of the Standard Specifications.

Damaged and unusable portions of the fence shall become the property of the CONTRACTOR and shall be disposed of outside the project site in accordance with Section

7-15, “Disposal of Material Outside the Highway Right of Way,” of these Special Provisions.

Full compensation for doing all the work involved in temporary fence, including furnishing, installing, moving, replacing, relocating and removing at end of the project of all temporary fencing shown on plans shall be considered as included in contract price paid for various items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**



## **SECTION 111**

### **POTHOLING**

#### **PART 1 – GENERAL**

1. Potholing shall occur at the two water line connection points near the “Entry” and “Exit” locations for the HDPE pipe. Potholing shall the CONTRACTOR’S proposed connection point between the existing water distribution system and the new HDPE line. Potholing shall establish existing water distribution piping type, size, depth, and orientation. Existing conditions shall be documented and submitted to ENGINEER.
2. Following completion of the potholing, CONTRACTOR shall develop a “Connection Plan” that details the proposed connection between the new HDPE water line and existing water lines. All joints, fittings, etc. shall be called out on the connection plan and shall comply with the project Specifications and Special Provisions. The “Connection Plan” shall be submitted to the ENGINEER a minimum of two weeks and approved before execution of connection work.
3. CONTRACTOR shall submit Potholing Methodology (2) two weeks prior to beginning of potholing operations.
4. Two weeks prior to any construction, potholing shall be performed at utility conflicts along utility trench alignments in order to determine the location, type and condition of underground utilities and shall conform to these special provisions. CONTRACTOR shall call USA prior to potholing.
5. The CONTRACTOR shall notify the Park two weeks prior to any removal or capping of existing utilities or for any utility shutdowns.
6. The method used by the CONTRACTOR for potholing shall be approved by the RCD and ENGINEER in advance of commencing any work, along with the required traffic controls. Existing utilities shown on plans is no guarantee as to the exact locations of the existing utilities. All potholing locations shall be approved by the RCD Inspector prior to potholing.
7. The CONTRACTOR shall take care not to damage any existing facilities during potholing. Existing facilities damaged by the CONTRACTOR’S operations shall be repaired or replaced to the satisfaction of the RCD’S ENGINEER, all at the CONTRACTOR’S expense.

Existing utilities shall be protected from damage in conformance with the provisions in Section 8-1.10, “Utility and Non-Highway Facilities” of the Standard Specifications, the Plans, these Special Provisions, and as directed by the ENGINEER.

The contract unit price paid shall include full compensation for furnishing all labor, materials, tools, equipment, and incidentals and for doing all the work involved in saw

cutting, excavation, trenching, backfill, compaction, and resurfacing, complete in place, including contacting USA, walking marked pothole locations with RCD prior to digging, adjusting pothole locations as requested by RCD; exposing utility line, providing trench shoring, surveying depth and diameter of utility line, preparing redlined mark-up, submitting potholing log and AutoCAD files, protecting utility line in-place, providing bedding and backfill for utility line, and repaving over utility line as shown on the plans, as specified in the Standard Specification and these Special Provisions, and as directed by the ENGINEER.

**END OF SECTION**

## SECTION 113

### CAST-IN-PLACE CONCRETE

#### PART 1 -GENERAL

##### 1.1 SUMMARY

- A Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes.

##### 1.2 ACTION SUBMITTALS

- A Product Data: For each type of product indicated.
- B Design Mixtures: For each concrete mixture.
- C Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement.
- D Formwork Shop Drawings: Prepared by or under the supervision of a qualified professional ENGINEER detailing fabrication, assembly, and support of formwork.

##### 1.3 INFORMATIONAL SUBMITTALS

- A Material certificates.
- B Material test reports.
- C Floor surface flatness and levelness measurements.

##### 1.4 QUALITY ASSURANCE

- A Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
  - A Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."
- B Testing Agency Qualifications: An independent agency, **acceptable to authorities having jurisdiction**, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
- C ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:
  - A ACI 301, "Specifications for Structural Concrete," Sections 1 through 5.
  - B ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

- D Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.
- E Preinstallation Conference: Conduct conference at Captain Cooper School.

## **PART 2 – PRODUCT**

### **2.1 FORM-FACING MATERIALS**

- A Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.
- B Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

### **2.2 STEEL REINFORCEMENT**

- A Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.
  - A Galvanized Reinforcing Bars: ASTM A 767/A 767M, Class I zinc coated after fabrication and bending.
- B Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from as-drawn steel wire into flat sheets.
- C Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.
- D Galvanized-Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain, fabricated from galvanized-steel wire into flat sheets.
- E Epoxy-Coated Welded Wire Reinforcement: ASTM A 884/A 884M, Class A coated, Type 1, plain steel.
- F Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice."

### **2.3 CONCRETE MATERIALS**

- A Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:
  - A Portland Cement: ASTM C 150, Type I gray.
- B Normal-Weight Aggregates: ASTM C 33, graded.
  - A Maximum Coarse-Aggregate Size: 3/4 inch nominal.

B Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C Water: ASTM C 94/C 94M and potable.

## 2.4 CURING MATERIALS

A Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

B Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

C Water: Potable.

## 2.5 CONCRETE MIXTURES

A Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

B Proportion normal-weight concrete mixture as follows:

A Minimum Compressive Strength: 2500 psi at 28 days.

B Maximum Water-Cementitious Materials Ratio: 0.40.

C Slump Limit: 4 inches plus or minus 1 inch.

D Air Content: 5.5 percent, plus or minus 1.5 percent at point of delivery for 1-1/2-inch nominal maximum aggregate size.

E Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 3/4-inch nominal maximum aggregate size.

F Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

## 2.6 FABRICATING REINFORCEMENT

A Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

## 2.7 CONCRETE MIXING

A Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M, and furnish batch ticket information.

A When air temperature is between 85 and 90 deg F, reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

## PART 3 - EXECUTION

### 3.1 FORMWORK

- A Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.
- B Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

### 3.2 EMBEDDED ITEMS

- A Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

### 3.3 STEEL REINFORCEMENT

- A General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

### 3.4 JOINTS

- A General: Construct joints true to line with faces perpendicular to surface plane of concrete.
- B Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by RCD's Representative.
- C Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:
  - A Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.
  - B Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch- wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

### 3.5 CONCRETE PLACEMENT

- A Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
- B Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or

planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

- A Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
- C Cold-Weather Placement: Comply with ACI 306.1.
- D Hot-Weather Placement: Comply with ACI 301.

### 3.6 FINISHING FORMED SURFACES

- A Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
- B Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

### 3.7 CONCRETE PROTECTING AND CURING

- A General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.
- B Cure concrete according to ACI 308.1, by one or a combination of the following methods:
  - A Moisture Curing: Keep surfaces continuously moist for not less than seven days.
  - B Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
  - C Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.
  - D Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

### 3.8 CONCRETE SURFACE REPAIRS

- A Defective Concrete: Repair and patch defective areas when approved by RCD's Representative. Remove and replace concrete that cannot be repaired and patched to RCD's Representative approval.

### 3.9 FIELD QUALITY CONTROL

- A Testing and Inspecting: Engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

### **PART 4 - PAYMENT**

The Contract lump sum price paid for this item shall include full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work required by these Special Provisions, including submittals, in a form approved by the ENGINEER, as specified in these Special Provisions, the Standard Specifications and as directed by the ENGINEER, and no additional compensation will be allowed therefore.

**END OF SECTION**



## SECTION 115

### DUCTILE IRON FITTINGS

#### PART 1 – GENERAL

##### 1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide all material, equipment and labor necessary to furnish and install ductile iron fittings and all appurtenant work, complete and operable, including all connections as shown on the Drawings and as specified herein.

##### 1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. General Requirements.
- B. Section 117                                      Protective Coating
- C. Section 103                                      Miscellaneous Piping, Valves, Fittings, and Appurtenances.

##### 1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. Commercial Standards:

AASHTO	Specifications for Highway Bridges.
ANSI/AWWA C104	Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
ANSI/AWWA C105	Standard for Polyethylene Encasement for Ductile Iron Piping for Water and Other Liquids.
ANSI/AWWA C110	Standard for Ductile-Iron and Gray-Iron Fittings, 3 In. Through 48 In., for Water and Other Liquids.
ANSI/AWWA C111	Standard for Rubber-Gasket Joints for Ductile-Iron Pressure

## Pipe and Fittings.

ANSI/AWWA C115	Standard for Flanged Ductile-Iron Pipe with Threaded Flanges.
ANSI/AWWA C150	Standard for the Thickness Design of Ductile-Iron Pipe.
ANSI/AWWA C151	Standard for Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
ANSI/AWWA C153	Standard for Ductile-Iron Compact Fittings, 3 In. Through 16 In., for Water and Other Liquids.
AWWA C600	Installation of Ductile Iron Water Mains and Their Appurtenances.
ASTM C 150	Specification for Portland Cement.
SSPC	Steel Structures Painting Council.

## B. National Fire Protection Association

NFPA 24 (2013 Edition) Standard for the Installation of Private Fire Service Mains and their Appurtenances

## 1.4 CONTRACTOR SUBMITTALS

A. Shop Drawings: The CONTRACTOR shall submit shop drawings and fittings in accordance with the requirements of the referenced standards and the following supplemental requirements as applicable:

1. Certified dimensional drawings of all valves, fittings, and appurtenances.
2. Certified dimensional drawings of joints, showing the manufacturer's allowable deflections.

3. Copies of the manufacturer's approved installation instructions for the types of joints being used.

B. Certificates of Compliance: Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section, and the following supplemental requirements:

1. Physical and chemical properties.
2. Hydrostatic test reports.

C. All expenses incurred in making samples for certification of tests shall be borne by the CONTRACTOR.

## **PART 2 -- PRODUCTS**

### **2.1 GENERAL**

A. Marking: The CONTRACTOR shall legibly mark specials in accordance with the laying schedule and marking diagram. All fittings shall be marked at each end with top field centerline.

### **2.2 PIPE FITTINGS AND SPECIALS**

A. Acceptable products for fittings are EBAA Megalug or approved equal.

### **2.5 DESIGN OF DUCTILE IRON FITTINGS**

A. Joint Design: Ductile iron fittings shall be mechanical joints, flanged joints. Push-on joints will not be allowed for fittings and valves for waterlines.

1. Mechanical joints shall conform to ANSI/AWWA C111.
2. Flanged joints shall conform to ANSI/AWWA C115, or ANSI/AWWA C110.

### 3. Joint Restraint Clamps

## 2.6 LINING

### A. Cement-Mortar Lining:

1. Cement-Mortar Lining for Shop Application: Interior surfaces of all ductile iron fittings and specials shall be cleaned and lined in the shop with cement-mortar lining applied centrifugally in conformity with ANSI/AWWA C104. During the lining operation and thereafter, the pipe shall be maintained in a round condition by suitable bracing or strutting. The lining machines shall be of a type that has been used successfully for similar work. Every precaution shall be taken to prevent damage to the lining.
2. If lining is damaged or found faulty at delivery site, the damaged or unsatisfactory portions shall be replaced with lining conforming to these Specifications and having a minimum thickness matching the factory lining.
3. Protection of Pipe Mortar Lining: All shop-applied cement mortar lining shall be given a seal coat of asphaltic material in conformance with ANSI/AWWA C104.

## **PART 3 -- EXECUTION**

### 3.1 INSTALLATION OF PIPE

A. Handling and Storage: All fittings, and appurtenances, shall be carefully handled and protected against damage, impact shocks and free fall.

1. The CONTRACTOR shall inspect each fitting prior to installation to ensure that there are no damaged portions of the fitting.
2. Not Used.
3. Before placement of pipe in the trench, each fitting shall be thoroughly cleaned of any foreign substance, which may have collected thereon and shall be kept clean at all times

thereafter. For this purpose, the openings of all pipes and fittings in the trench shall be closed during any interruption to the WORK.

4. Coatings shall be provided in accordance with Section “Protective Coating.”

B. Polyethylene encasement shall be applied in conformance with the coating manufacturer’s printed recommendations, and in accordance with the requirements of Section “Protective Coating.”

#### **PART 4 -- PAYMENT**

Full compensation for doing all the work involved in Ductile Iron Fittings, including furnishing all labor, supervision, material, tools, equipment and incidentals, and for doing all work involved in installing all ductile iron fittings; shown on plans shall be considered as included in contract price paid for various items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**

## **SECTION 116**

### **POLYWRAP**

#### **PART 1 -- GENERAL**

##### **1.1 THE REQUIREMENT**

- A. The CONTRACTOR shall furnish and install 2 layers of protective wrapping for coated ductile iron pipe, valves and fittings.

##### **1.2 RELATED WORK SPECIFIED ELSEWHERE**

- A. Section 117 Protective Coating.
- B. Section 115 Ductile Iron Fittings.
- C. General Requirements.

##### **1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS**

###### **A. Commercial Standards:**

AWWA C105	Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
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NFPA 24 (2013 Edition)	National Fire Protection Association 24 (2013 Edition) – Standard for the installation of Private Fire Service Mains and Their Appurtenances
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2013 California Building Code

2013 California Fire Code

##### **1.4 CONTRACTOR SUBMITTALS**

- A. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.

## **PART 2 -- PRODUCTS**

### **2.1 MATERIALS**

A. **General Purpose Adhesive Tape:**

1. Two inches wide by 10 mils thick minimum, to 20mils thick maximum.
2. Scotch wrap No. 50, Polyken No. 900, Tapecoat CT, Plymouth Slipnot 100, Manville No. V-10 Trantex, Renfru 300-10, Wrap-tite WT 46-12, or approved.

B. **Polywrap:**

1. AWWA C105, Type I, Class C(black), Grade E-1, 8 mil minimum thickness.
2. Minimum polywrap tube size shall be

Nominal Mortar Coated Steel

Polywrap Flat

Pipe Diameter (inches)

Tube Width (inches)

4

16

## **PART 3 -- EXECUTION**

### **3.1 INSTALLATION**

- A. Two layers of polyethylene encasement for all pipe, fittings and valves.

B. **Installation on Pipe:**

1. Cut polywrap tube to a length approximately 2 feet longer than the length of the pipe section.
2. Slip Polywrap around the pipe, centering it to provide a 1 foot overlap of each adjacent pipe section.
3. Bunch polywrap accordion fashion until it clears the pipe ends.
4. Provide bell hole in trench at joints to facilitate installation of polywrap.

5. After *assembling* pipe joint, pull bunched polywrap from preceding length of pipe, slip over end of new length of pipe, and secure in place with one circumferential turn of tape plus enough overlap to assure adhesion.
6. Slip end of the polywrap from the new section over the end of the polywrap from the preceding section until it overlaps the joint at the end of the preceding length of pipe.
7. Tape in place.
8. Take up slack width at the top of pipe to make a snug but not tight fit along the barrel of the pipe, securing the fold at the spring line as necessary with adhesive tape. Fold flap shall be in down position.
9. Repair any rips, punctures, or other damage to the polywrap with tape, or with short length of polywrap tube cut open, wrapped around the pipe and secured with the tape.
10. Proceed with installation of next section of pipe in the same manner.

C. Bends Reducers and Offsets:

1. Cover with Polywrap in the same manner as the pipe.

D. Non-Epoxy Coated Valves and Odd shaped pieces:

1. Wrap with a flat sheet obtained by splitting open a length of polywrap tube.
  - a. Sheet shall be passed under the valve and brought up around the body of the stem.
  - b. Make seams by bringing the edges together, folding twice, and taping down.
  - c. Slack width and overlap at joints shall be handled as described above.
  - d. Tape polywrap securely in place at valve stem and other penetrations.

E. Openings for Appurtenances:

1. Openings for branches, service taps, blow offs, air valves, and similar appurtenances shall be made by making an x-shaped cut in the polywrap and temporarily folding the film back.
2. After installation of the appurtenances, replace film and repair cur as well as other damaged areas in the polywrap with tape.
3. Branches, service taps, blow offs, air valves, and similar appurtenances shall not be wrapped with polywrap unless otherwise specified or shown on the drawings.

F. Junction Between Wrapped and Unwrapped Pipe:



1. Where polywrapped pipe joins a pipe which is not wrapped, extend the polywrap tube to cover the unwrapped pipe a distance of two feet, unless otherwise shown on the drawings.
2. Secure the end with circumferential turns of tape.

G. Cast Iron Fittings when specified on Drawings:

1. Polywrap shall extend beyond fittings by 8" on each side and shall be secured by tape.
2. Polywrap shall be overlapped 6" when split is required. The split shall be sealed with tape.

H. Backfill:

1. Material and compaction shall be the same as specified for pipe without polywrap.
2. Exercise care to prevent damage to the polywrap.

#### **PART 4 -- PAYMENT**

Full compensation for doing all the work involved in Polywrap, including furnishing all labor, installing, supervision, material, tools, equipment and incidentals, and for doing all work in polyethylene encasement per AWWA C105 all ductile iron pipes and fittings shown on the plans, as specified in these special provisions shall be considered as included in contract price paid for various items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**

## SECTION 117

### PROTECTIVE COATING

#### PART 1 -- GENERAL

##### 1.1 THE REQUIREMENT

- A. The CONTRACTOR shall provide all materials, equipment and labor necessary to furnish and install the protective coating of all specified surfaces including, but not necessarily limited to, all surface preparation, pretreatment, coating application, touch-up of factory-coated surfaces, protection of surfaces not to be coated, cleanup, and all appurtenant work, complete in place, as specified herein.
- B. The Coating System Schedules summarize the surfaces to be coated, the required surface preparation, and the coating systems to be applied. Coating notes on the drawings are used to show exceptions to the schedules, to show or extend the limits of coating systems, or to clarify or show details for application of the coating systems.
- C. The CONTRACTOR shall be responsible for compliance with EPA and DPH regulations for all products and materials, and use of all products and materials.

##### 1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

###### A. Commercial Standards:

ANSI/AWWA C105	Standard for Polyethylene Encasement for Ductile-Iron Piping for Water and Other Liquids.
AWWA C116-09	Protective Fusion-Bonded Epoxy Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray-Iron Fittings for Water Supply Service
ASTM C 309	Specification for Liquid Membrane - Forming Compounds for Curing Concrete.

AWWA C550	Standard for Protective Epoxy Interior Coatings for Valves and Hydrants.
NACE	National Association of Corrosion ENGINEERs.
NSF	National Sanitation Foundation.
SSPC	Steel Structures Painting Council.

### 1.3 CONTRACTOR SUBMITTALS

- A. **Certificates of Compliance:** Certificates of Compliance shall be provided for all products and materials proposed to be used under this Section.
- B. **Paint Manufacturer's Information:** For each paint system to be used the CONTRACTOR shall submit the following listed data.
1. Paint manufacturer's data sheet for each product used, including statements on the suitability of the material for the intended use.
  2. Paint manufacturer's printed instructions and recommendations on surface preparation and application.
  3. Colors available for each product (where applicable).
  4. Compatibility of shop and field applied coatings (where applicable).
  5. Current material safety data sheet for each product used.
  6. Two sets of color samples to match each color selected by the ENGINEER from the manufacturer's standard color sheets. If custom mixed colors are required by this Section, the color samples shall be made using color formulations prepared to match the color samples furnished by the ENGINEER. The color formula shall be shown on the back of each color sample.

## 1.4 QUALITY ASSURANCE

- A. **Surface Preparation:** Evaluation of blast cleaned surface preparation work will be based upon comparison of the blasted surfaces with the definitions and standard visual samples available from the SSPC, using SSPC-VIS1 Standards. The ENGINEER shall be sole judge as to whether the quality of blast cleaning conforms to visual comparison standards, and its decision as to allowability shall be final.
- B. **Film Thickness Testing:** On ferrous metals, the dry film coating thickness will be measured in accordance with SSPC "Paint Application Specification No. 2." Each coat will be tested for the correct thickness. No measurements will be made until at least 8 hours after application of the coating. On non-ferrous metals and other substrates, the coating thicknesses will be measured at the time of application using a wet film gage.

## PART 2 -- PRODUCTS

### 2.1 GENERAL

- A. **Definitions:** The term "paint," "coatings," "linings," 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. The term "DFT" means minimum dry film thickness.
- B. **General:** Coating materials shall be sealed in containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer, all of which shall be plainly legible at the time of use.
- C. The CONTRACTOR shall use coating materials suitable for the intended use and recommended by their manufacturer for the intended service.
- D. **Compatibility:** In any coating system only compatible materials from a single manufacturer shall be used in the WORK. Particular attention shall be directed to compatibility of primers and finish coats. If necessary, subject to the requirements of the ENGINEER, a barrier coat

shall be applied between existing prime coat and subsequent field coats to ensure compatibility.

- E. **Colors:** All colors of paint shall be as selected or specified by the ENGINEER. Finish colors shall be as specified from the manufacturer's standard color samples.
- F. **Protective Coating Materials:** Products shall be standard products produced by recognized manufacturers who are regularly engaged in production of such materials for essentially identical service conditions.
- G. **Substitute or "Or-Equal" Submittals:** Unless otherwise specified, materials are from the catalogs of the companies listed herein. Materials by other manufacturers are acceptable provided that they are established as being compatible with and of equal quality to the coatings and colors of the companies listed. The CONTRACTOR shall provide satisfactory documentation from the firm manufacturing the proposed substitute or "or-equal" material that said material meets the specified requirements and is equivalent or better than the specified materials.

## 2.2 COATING SYSTEMS

- A. **Materials:** Each of the following manufacturers listed in this section is capable of supplying many of the coating materials specified herein. Where manufacturers and paint numbers are listed, it is to show the type and quality of coatings that are required. Proposed substitute materials must be shown to satisfy the material descriptions and to equal or exceed the properties of the listed materials as required in the paragraph entitled "Substitute or 'Or-Equal' Submittals" herein. The decisions of the ENGINEER as to acceptable color substitutions will be final.
- B. **System 1 - Alkyd Enamel:** High quality, gloss or semi-gloss, medium long oil alkyd finish shall have a minimum solids content of 49 percent by volume. Primer shall be as recommended by manufacturer. Hydrant colors shall be as follows:

- 1. Potable Water System:

- a. New Hydrants: All new hydrants shall be factory coated with two (2) coats of white alkyd enamel paint with RCD approved color for the top, based on flow.
  2. **Guard Posts:** Guard posts shall be installed as shown on the Drawings. All Guard posts for potable water systems shall be painted white with gloss enamel paint as approved by the ENGINEER.
  3. Paint manufacturers for all other uses shall be as follows:
    - a. Prime Coat: **Sherwin Williams, Kem-Kremik Universal Primer, DuPont 681 FD, or equal.**
    - b. Finish Coat: **Sherwin Williams, Industrial Gloss Enamel, DuPont 31 PSG, or equal.**
  4. Coating requirements shall be as follows:
    - a. Prime Coat DFT = 3 mils each
    - b. Finish Coat (2 or more) DFT = 3 mils each
    - c. Total System DFT = 6 mils, minimum
- C. **System 2 - Fusion Bonded Epoxy:** The coating material shall be a 100-percent powder epoxy applied in conformance with AWWA C550, except that the surface preparation shall be as specified in the Coating System Schedule of this Section.
1. Liquid Epoxy: For field repairs the use of a liquid epoxy will be permitted, applied in not less than 3 coats to provide a total DFT of 12 mils. The liquid epoxy shall be a 100-percent solids epoxy recommended by the powder epoxy manufacturer.
  2. Field repair coating (DFT = 12 mils), **Scotchkote 306 or 312, DURA-POX 646, or equal.**
- D. **System 3 - Polyethylene Encasement:** Application of polyethylene encasement shall be in conformance with ANSI/AWWA C105 using Method A with a layers of polyethylene encasement. Minimum thickness of one layer of polyethylene encasement shall be 8 mils in accordance with AWWA C105.

- E. **System 4 - Cement Mortar Coating:** Unless otherwise specified on the Drawings, mortar coating and reinforcement shall be in conformance with AWWA C205.
- F. **System 5 - Factory Applied Epoxy:** The coating material shall be a liquid epoxy applied in conformance with AWWA C550.

### **PART 3 -- EXECUTION**

#### **3.1 STORAGE, MIXING AND THINNING OF MATERIALS**

- A. Recommendations: Unless otherwise specified herein, the coating manufacturer's printed recommendations and instructions for thinning, mixing, handling, applying, and protecting its coating materials, for preparation of surfaces for coating, and for all other procedures relative to coating shall be strictly adhered to. The CONTRACTOR shall supply the ENGINEER with copies of each manufacturer's printed recommendations and instructions for review prior to use of any coating product.
- B. All protective coating materials shall be used within the manufacturer's recommended shelf life.
- C. **Storage and Mixing:** Coating materials shall be protected from exposure to cold weather, and shall be thoroughly stirred, strained, and kept at a uniform consistency during application. Coatings of different manufacturers shall not be mixed together.

#### **3.2 APPLICATION OF COATINGS**

- A. The application of protective coatings to steel substrates shall be in accordance with "Paint Application Specification No. 1, (SSPC-PA1)," Steel Structures Painting Council.
- B. Coatings shall be applied in accordance with the manufacturer's printed instructions and recommendations and this Section, whichever has the most stringent requirements.

- C. Special attention shall be given to materials which will be joined so closely that proper surface preparations and application are not possible. Such contact surfaces shall be coated prior to assembly or installation.
- D. Coatings shall not be applied under the following conditions:
- a. Temperature above or below the manufacturer's recommended maximum and minimum allowable.
  - b. Dust or smoke laden atmosphere.
  - c. Damp or humid weather.
- E. All field coating shall be in conformance with the Manufacturer's printed recommendations.

### 3.3 COATING SYSTEMS SCHEDULES - FERROUS METALS

#### A. Coating System Schedule, Ferrous Metal - Not Galvanized:

	Item	Surface Preparation	System No.
FM-1	Exposed FHs, valve lids, marker posts, Backflow Preventers lettering, exposed pipe and fittings, and vent pipe.	Solvent Cleaning SSPC-SP1	(1) Alkyd Enamel
FM-2	Fittings and flanged joints, where the piping is plastic. Buried fittings on ductile iron pipe used for FH laterals, fire service laterals, and Backflow Prevention Assemblies. Joints, and	White Metal Blast Cleaning SSPC-SP5	(2) Fusion Bonded Epoxy



fittings on ductile iron  
pipe.

FM-3	Buried pipe couplings; fittings; and flanged joints, including epoxy coated surfaces, except valves; where the piping is polyethylene encased ductile iron.	As specified by reference specification for appropriate fittings.	(3)	Polyethylene Encasement
FM-4	Buried cast couplings, buried sleeve-type tapping sleeves, welded tapping outlets. Ferrous surfaces of gate valves.	White Metal Blast Cleaning SSPC-SP5	(2)	Fusion Bonded Epoxy
FM-5	External ferrous surfaces of check valves.	White Metal Blast cleaning SSPC-SP5	(2)	Fusion Bonded Epoxy
FM-6	Ferrous internal surfaces of fire hydrants.	White Metal Blast cleaning SSPC-SP5	(2)	Fusion Bonded Epoxy
FM-7	Internal/External Ferrous Surfaces of butterfly valves	White Metal Blast Cleaning SSPC-SP5	(5)	Factory Applied Epoxy

#### **PART 4 -- PAYMENT**

Full compensation for doing all the work involved in Protective Coating, including furnishing all labor, installing, supervision, material, tools, equipment and incidentals, and for doing all protective coating work as shown on plans, as specified in these special provisions shall be considered as included in contract price paid for various items of work, and no additional compensation will be allowed therefor.

**END OF SECTION**



## **Appendix A**

### **Daily Personnel and Equipment Log**



## DAILY PERSONNEL AND EQUIPMENT LOG

Using as many copies of this form necessary, the CONTRACTOR shall provide the ENGINEER with a list of all personnel and their title and, if applicable, equipment said employee is operating. This information is required of the Prime and their Subcontractors.

**This form shall be submitted to the ENGINEER by the start of the first working day subsequent to the performance of the work, or CONTRACTOR may incur task-specific liquidated damages in the amount of \$500 per day for every day hence until submittal is made.**

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

**Project No.:** \_\_\_\_\_

**Project:** \_\_\_\_\_

**CONTRACTOR:** (Name of CONTRACTOR)

**Is this log for Subcontractor?** \_\_\_\_\_ Yes \_\_\_\_\_ No

**If yes, Name of Subcontractor:** \_\_\_\_\_

[illegible]

**EXHIBIT B**  
**Cost Proposal Form**  
Huckleberry Flat Pipeline Project at Memorial County Park

To: Board of Directors, San Mateo Resource Conservation District

We, the undersigned, having familiarized ourselves with all project plans and local conditions affecting the cost of work to be done, along with the cost proposal and contract documents, hereby propose to provide and furnish all labor, materials, utilities, transportation, and equipment of all types and kinds and to complete the project as specified and described in Exhibit A.

We, the undersigned, agree to perform all of the above work to its completion and to the satisfaction of the RCD for the rates and prices for said work as indicated below.

We, the undersigned, understand that the contract is a lump sum contract. The Contractor cannot be paid over the sum not to exceed without a change order from the RCD. The RCD will not be responsible for any loss of anticipated profits due to reductions in the size of the contract.

**1. BID SHEET**

<div>BID SHEET</div> <div>Memorial Park Water Replacement Line - Huckleberry Segment</div>							
Cost Estimate Item			Pay Type	Units	Unit Rate	Quantity	Total
<b>1.o) Site Mobilization/Demobilization</b>							
	1.1	Portable Toilet	Lump Sum	MO		3	
	1.2	Equipment Mob/Demob	Lump Sum	EA		1	
	1.3	Pre-construction Meeting	Lump Sum	EA		1	
	1.4	Pre-construction Submittals	Lump Sum	EA		1	
	1.5	Potholing at Entry Tie-In	Lump Sum	EA		1	
	1.6	Potholing at Exit Tie-In	Lump Sum	EA		1	
	1.7	Perimeter Silt Fence	Lump Sum	LF		350	
<b>2.o) Waterline Installation</b>							
	2.1	Waterline Installation	Lump Sum	LF		1200	
	2.2	Waterline Connection (Entry)	Lump Sum	LF		150	
	2.3	Waterline Connection (Exit)	Lump Sum	LF		150	
	2.4	Waterline Pressure Test	Lump Sum	EA		1	
	2.5	Waterline Disinfection	Lump Sum	EA		1	
<b>4.o) Administration</b>							
	4.1	Management	Lump Sum	HR			
	4.2	Bonding	Lump Sum	EA		1	
						<b>TOTAL</b>	

**Total Bid (in numbers):**

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**Total Bid (in words):**

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## 2. CERTIFICATION

I hereby certify that:

- A. All of the statements herein made by me are made on behalf of  
\_\_\_\_\_ [company name],  
\_\_\_\_\_ [Director/CEO name]
- B. I have thoroughly examined the plans and specifications, contract documents and all other items bound herein;
- C. I have carefully prepared this Cost Proposal form and have checked the same in detail before submitting this bid;
- D. I have full authority to make such statements and to submit this bid on the Company's behalf; and
- E. The statements herein are true and correct.

Signature \_\_\_\_\_ Date \_\_\_\_\_

By \_\_\_\_\_

Title \_\_\_\_\_

Calif. Contractor's License #: \_\_\_\_\_ Classification: \_\_\_\_\_

Name of Qualifier for License: \_\_\_\_\_

Federal Tax Identification #: \_\_\_\_\_

Company Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Email: \_\_\_\_\_

Project Representative: \_\_\_\_\_

Representative's Phone: \_\_\_\_\_ Email: \_\_\_\_\_

### 3. **SUBCONTRACTORS**

List subcontractors you are planning to use on this project, if any. Provide company name and California contractor license number and classification.

Name of Subcontractor: \_\_\_\_\_

License #: \_\_\_\_\_ Classification: \_\_\_\_\_

Name of Subcontractor: \_\_\_\_\_

License #: \_\_\_\_\_ Classification: \_\_\_\_\_

Name of Subcontractor: \_\_\_\_\_

License #: \_\_\_\_\_ Classification: \_\_\_\_\_

Name of Subcontractor: \_\_\_\_\_

License #: \_\_\_\_\_ Classification: \_\_\_\_\_

Name of Subcontractor: \_\_\_\_\_

License #: \_\_\_\_\_ Classification: \_\_\_\_\_

#### **4. REFERENCES**

List projects and contact information for use as reference, or attach reference documentation. Experience with similar projects and knowledge of and experience with central and/or north coastal California environmental constraints (soils, topography, hydrology etc.) will be considered in the evaluation of bids.

**PROJECT NAME** \_\_\_\_\_

Brief description of project:

Date(s) constructed:

Reference (name & phone):

**PROJECT NAME** \_\_\_\_\_

Brief description of project:

Date constructed:

Reference (name & phone):

**PROJECT NAME** \_\_\_\_\_

Brief description of project

Date constructed:

Reference (name & phone):

**EXHIBIT C**  
**Sample Contract**  
**SAN MATEO RESOURCE CONSERVATION DISTRICT**  
**PROFESSIONAL SERVICES AGREEMENT WITH**  
**CONTRACTOR NAME**

THIS AGREEMENT ("Agreement"), made and entered into this \_\_\_\_ day of \_\_\_\_\_, 2018 is by and between the **SAN MATEO RESOURCE CONSERVATION DISTRICT**, a political subdivision of the State of California, hereinafter referred to as "**RCD**," and **CONTRACTOR NAME**, hereinafter referred to as "**CONTRACTOR**."

**WITNESSETH:**

**WHEREAS**, RCD received funding from the California Department of Water Resources (Agreement No.4600010883 )and San Mateo County Parks Department for the Huckleberry Flat Pipeline Project; and

**WHEREAS**, RCD released a Request for Bids on [DATE]; and

**WHEREAS**, CONTRACTOR submitted a bid on [Date]; and

**WHEREAS**, RCD desires to use the professional services of CONTRACTOR; and

**WHEREAS**, RCD Board of Directors approved the bid on [Date]; and

**WHEREAS**, CONTRACTOR has the professional and administrative ability to implement such services; and

**WHEREAS**, RCD and CONTRACTOR desire to set forth in writing the obligations and responsibilities of each party relating to the services;

**NOW, THEREFORE**, in consideration of the promises and mutual benefits which will accrue to the parties hereto in carrying out the terms of this Agreement, the parties agree as follows:

**1. Scope of Services**

- a) CONTRACTOR will, in accordance with the terms of this Agreement, perform the services set forth in Request for Proposals to Huckleberry Flat Pipeline Project [DATE]), hereinafter referred to as "PROJECT", which is incorporated herein by reference, and CONTRACTOR's Huckleberry Flat Pipeline Project Bid, [Sample contract] Exhibit A, attached hereto and incorporated herein.
- b) CONTRACTOR must provide RCD with copies of insurance, materials bond and performance bond, prior to the commencement of PROJECT.
- c) This Agreement is limited both in scope and duration, as herein specified.

**1. Term of Agreement.** The term of this Agreement shall commence on [DATE] and terminate on [DATE], but shall not become effective until executed by the parties.

**2. Performance Responsibilities.** CONTRACTOR shall complete the herein described services by no later than [DATE] unless a later date is agreed upon by the parties in writing. Time is and shall be of the essence in the performance of the specified services by CONTRACTOR.

**3. Compensation.**

- a. In consideration of the services provided by CONTRACTOR in accordance with all applicable terms, conditions and specifications set forth in this Agreement and in Exhibit A, RCD agrees to pay CONTRACTOR an amount not to exceed AMOUNT AS TEXT, (\$xx.xx) for the successful and timely completion of the specified services. In no event shall RCD's total fiscal obligation under this Agreement exceed (AMOUNT AS TEXT (\$xx.xx)). In the event that RCD makes any advance payments, CONTRACTOR agrees to refund any amounts in excess of the amount owed by RCD at the time of contract termination or expiration. CONTRACTOR is not entitled to payment for work not performed as required by this Agreement.
  - b. In the event that the funding on which the above described contract services relies is materially reduced or made unavailable, despite the parties understandings and expectations that no such disruptions will occur, this Agreement will terminate immediately upon notice of such funding disruption by RCD to CONTRACTOR.
4. **Billing and Payment Procedure.** CONTRACTOR will submit requests for payment along with documentation acceptable to the RCD no more frequently than monthly and no less frequently than quarterly. RCD will issue payment to CONTRACTOR within 30 days of payment to the RCD by the project funder.
5. **Cooperation.** RCD and CONTRACTOR agree to cooperate in any way and every way or manner on the PROJECT. RCD will immediately transmit to CONTRACTOR any new information which becomes available or any change in plans. CONTRACTOR will likewise bring any new information, issues or concerns to the RCD's attention as soon as practicable.
6. **Assignment.** Without the written consent of RCD, this Agreement is not assignable by CONTRACTOR in whole or in part.
7. **Conflict of Interest.** The CONTRACTOR shall comply with all applicable State laws and rules pertaining to conflicts of interest, including but not limited to, Government Code Section 1090 and Public Contract Code 10410 and 10411. If requested by the State, CONTRACTOR may be required to file a Statement of Economic Interests (Fair Political Practices Commission Form 700) if it is determined that an individual is a consultant for Political Reform Act purposes.
8. **Applicable Laws.** All work performed on behalf of the RCD, as set forth in this Agreement shall be performed in accordance with all applicable state and federal laws, regulations, policies, procedures, and standards.
9. **Environmental Quality.** CONTRACTOR shall comply with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act, Title 42 U.S.C. 1857 (H), Section 508 of the Clean Air Act, Title 33 U.S.C. 1368 Executive Order 11738, and Title 40 CFR Part 15. CONTRACTOR will comply with mandatory standards and policies related to energy efficiency which are contained in the State Energy Conservation Plan issued in compliance with the Conservation Act (Publ L. 94-163). CONTRACTOR will also comply with any special permit conditions prescribed by regulatory agencies for the Project.
  - a. The CONTRACTOR shall not be (1) in violation of any order or resolution not subject to review promulgated by the State Air Resources Board; (2) subject to cease and desist order not subject to review issued pursuant to Section 13301 of the Water Code for violation of waste discharge requirements or discharge prohibitions; or (3) finally determined to be in violation of provisions of and federal or State of California law relating to air or water pollution.

- b. All activities covered by this contract must be in compliance with the California Environmental Quality Act (CEQA). (Public Resources Code §21000 et seq.)

- 10. No Benefit To Arise For Local Employees.** Except as provided by State law, no member, officer, or employee of RCD or its designees or agents, and no public official who exercises authority over or has responsibilities with respect to the Project during their tenure or for one (1) year thereafter, shall have any interest, direct or indirect, in any agreement or sub-agreement or the proceeds thereof, for work to be performed in connection with the services performed under this Agreement.
- 11. Independent Contractor Status.** The CONTRACTOR, and the officers, the agents and employees of the CONTRACTOR, in the performance of the Agreement, shall act in an independent capacity and not as officers, employees or agents of the RCD. Nothing in this Agreement is intended nor shall be construed to create an employer-employee relationship, a joint venture relationship.
- 12. Standard of Professionalism.** CONTRACTOR shall conduct all work consistent with professional standards for the industry and type of work being performed under this Agreement.
- 13. Ownership of Materials.** Except as otherwise expressly stated in Exhibit A, all materials and work products, including data collected for the Work produced as a result of this Agreement are the property of the RCD. Any final products distributed or produced will acknowledge the CONTRACTOR, RCD, and other Funding Agencies as reasonably requested by the RCD. The RCD shall be entitled to use and publish the work product and deliverables under this Agreement.
- 14. Indemnification.** To the fullest extent permitted by applicable law, CONTRACTOR agrees to defend, at CONTRACTOR's expense and with counsel acceptable to RCD, indemnify, and save and hold harmless RCD and all of its officers, directors, employees and agents, from and against any and all claims, suits, losses, causes of action, damages, liabilities, and expenses of any kind whatsoever arising out of the performance or nonperformance of the CONTRACTOR's Work, including without limitation, all expenses of litigation and/or arbitration, court costs, and attorneys' fees, arising on account of or in connection with injuries to or the death of any person whomsoever, or any and all damages to property, regardless of possession or ownership, which injuries, death or damages arise from, or are in any manner connected with, the Work performed by or for the CONTRACTOR under this Agreement, or are caused in whole or part by reason of the acts or omissions or presence of the person or property of the Contractor or any of its employees, agents, representatives and or suppliers.

In addition, the Contractor shall indemnify and save harmless those public and private agencies ("grantors") which provided grant funds to RCD to complete this project, specifically the State of California and California Department of Water Resources and San Mateo County Parks Department grantors' officers, agents and employees from any and all liabilities, claims, demands, damage or costs resulting from, growing out of, or in any way connected with or incident to this agreement, except for active negligence of such agency, its officers, agents or employees. The duty of the Contractor to indemnify and save harmless includes the duty to defend as set forth in Civil Code Section 2778.

- 15. Insurance.** CONTRACTOR shall obtain and maintain for the duration of this Agreement, comprehensive general liability insurance and/or other insurance necessary to protect the parties hereto, and shall provide RCD with evidence thereof. CONTRACTOR shall have RCD and funding agencies [California Department of Water Resources, San Mateo County Parks Department] named as an additional insured on its insurance policy, which shall have minimum coverage limits as specified in Exhibit B, as is incorporated herein by reference. CONTRACTOR's above described insurance shall serve as the primary insurance coverage for any claim arising from or relating to the

services to be performed hereunder. Neither the RCD, its partners or funders are responsible for any premiums or assessments on these policies.

- 16. Non-discrimination.** During the performance of this Agreement, CONTRACTOR will not unlawfully discriminate, harass, or allow harassment against any employee or applicant for employment because of sex (gender), sexual orientation, race, color, ancestry, religion, creed, national origin (including language use restriction), pregnancy, physical disability (including HIV and AIDS), mental disability, medical condition (e.g., cancer), age (over 40), marital status, and denial of medial and family care leave or pregnancy disability leave. CONTRACTOR shall ensure that the evaluation and treatment of its employees and applicants for employment are free from such discrimination and harassment. CONTRACTOR will comply with the provisions of the Fair Employment and Housing Act (Gov Code 12990 (a-f) et seq.) and the applicable regulations promulgated there under (California Code of Regulations, Title 2, Section 7285 et seq.). The applicable regulations of the Fair Employment and Housing Commission implementing Government Code Section 12900 (a-f), set forth in Chapter 5 of Division 4 of Title 2 of the California Code of Regulations, are incorporated into this Agreement by reference and made a part hereof as if set forth in full. CONTRACTOR will give written notice of its obligations under this clause to labor organizations with which they have a collective bargaining or other Agreement.
- 17. Americans with Disabilities Act:** By signing this Agreement, CONTRACTOR assures that it is in compliance with the Americans with Disabilities Act (ADA) of 1990, (42 U.S.C., 12101 et seq.), which prohibits discrimination on the basis of disability, as well as all applicable regulations and guidelines issued pursuant to the ADA.
- 18. Drug-Free Workplace Certification:** By signing this Agreement, CONTRACTOR hereby certify, under penalty of perjury under the laws of State of California, compliance with the requirements of the Drug-Free Workplace Act of 1990 (Government Code 8350 et seq.) and have or will provide a drug-free workplace by taking the following actions:
- a. Publish a statement notifying employees, and subcontractors that unlawful manufacture, distribution, dispensation, possession, or use of a controlled substance is prohibited and specifying actions to be taken against employees, contractors, or subcontractors for violations, as required by Government Code Section 8355 (a)(1).
  - b. Establish a Drug-Free Awareness Program, as required by Government Code Section 8355(a)(2) to inform employees or subcontractors about all of the following:
    - i. The dangers of drug abuse in the workplace
    - ii. Grantee's policy of maintaining a drug-free workplace,
    - iii. Any available counseling, rehabilitation, and employee assistance programs, and
    - iv. Penalties that may be imposed upon employees and subcontractors for drug abuse violations.
  - c. Provide, as required by Government Code Sections 8355(a)(3), that every employee, contractor, or subcontractor who works under this Grant Agreement will receive a copy of Grantee's drug-free policy statement, and will abide by terms of the policy.
- 19. Notices.** Any notice required to be given pursuant to the terms and provisions of this Agreement shall be in writing and shall be sent first-class mail. Notice shall be deemed to be effective two (2) days after mailing to the following addresses:

**To RCD:**

Kellyx Nelson, Executive Director  
San Mateo Resource Conservation District  
80 Stone Pine Rd, Ste 100

**To CONTRACTOR:**      **CONTRACTOR NAME**  
   **ADDRESS**

- 20. Rights in Data.** CONTRACTOR agrees that all data including notes and other written and graphic work produced in performance of this Agreement are subject to the rights of the State of California. The State shall have the right to reproduce, publish and use all such work, or any part thereof, in any manner and for any purpose whatsoever and to authorize others to do so.
- 21. Records.** CONTRACTOR is hereby notified of the rights of the auditors of the State of California to examine records of the CONTRACTOR and any subcontractors relative to the services and materials provided under this Agreement. The CONTRACTOR agrees to expeditiously provide throughout the term of this Agreement, such reports, data, information, and certifications as may be reasonably required by the RCD or by the State.
- 22. Amendments and Integration.** This Agreement supersedes all previous agreements or understandings, and constitutes the entire understanding between the parties with respect to the above referenced services, terms of compensation, and otherwise. This Agreement shall not be amended, except in a writing that is executed by authorized representatives of both parties.
- 23. Compliance with Federal Regulations.** As a grantee of the State of California, the RCD is obligated to warrant, represent that it and its contractors comply with: 1) all applicable provisions of Title 48 CFR Part 31; and 2) all general and special conditions contained in this Agreement.
- 24. Labor Code Compliance:** The CONTRACTOR will take all measures necessary to ensure compliance with applicable California Labor Code requirements, including, but not limited to Section 1720 *et seq.* of the California Labor Code regarding public works, labor compliance programs (California Labor Code Section 1771.5), and payment of prevailing wages for work done and funded pursuant to these Guidelines, including any payments to the Department of Industrial Relations under Labor Code Section 1771.3.

As a condition of receiving payments for this Project, the CONTRACTOR agrees to present to the RCD, or its designee, all applicable and necessary required documentation required to show compliance with a Labor Compliance Program, as required by the California Labor Code.

The RCD shall withhold any portion of a payment until all required forms and documentation of compliance of the Labor Compliance Program are properly submitted. In the event that certified payroll forms do not comply with the requirements of Labor Code Section 1720 *et seq.*, the RCD may continue to hold sufficient funds to cover estimated wages and penalties under the contract.

- 25. Standards for Financial Management System:** CONTRACTOR shall maintain fiscal control and accounting procedures which are sufficient to permit tracing of funds to a level of expenditures adequate to establish that such funds have not be used in violation of the restrictions and prohibitions of this Agreement. A requirement to this effect shall be placed in all subcontractors related to performance of work under this Agreement.
- 26. Compliance with County Employee Jury Service Ordinance**  
Contractor shall comply with Chapter 2.85 of the County's Ordinance Code, which states that Contractor shall have and adhere to a written policy providing that its employees, to the extent they are full-time employees and live in San Mateo County, shall receive from the Contractor,



on an annual basis, no fewer than five days of regular pay for jury service in San Mateo County, with jury pay being provided only for each day of actual jury service. The policy may provide that such employees deposit any fees received for such jury service with Contractor or that the Contractor may deduct from an employee's regular pay the fees received for jury service in San Mateo County. By signing this Agreement, Contractor certifies that it has and adheres to a policy consistent with Chapter 2.85. For purposes of this Section, if Contractor has no employees in San Mateo County, it is sufficient for Contractor to provide the following written statement to County: "For purposes of San Mateo County's jury service ordinance, Contractor certifies that it has no full-time employees who live in San Mateo County. To the extent that it hires any such employees during the term of its Agreement with San Mateo County, Contractor shall adopt a policy that complies with Chapter 2.85 of the County's Ordinance Code."

- 27. Termination.** This Agreement may be terminated for any of the following reasons:
- a. If CONTRACTOR fails to perform the services hereunder agreed to the satisfaction of RCD, or otherwise fails to fulfill its obligations under this Agreement, immediately upon written notice from RCD; and
  - b. Upon notice from RCD to CONTRACTOR that the funding on which this Agreement is based has been materially disrupted or discontinued.

**IN WITNESS WHEREFORE,** the parties agree to the foregoing terms and conditions and hereby enter into this Agreement.

Date: \_\_\_\_\_ By: \_\_\_\_\_  
**NAME, TITLE**  
**CONTRACTOR NAME**

Date: \_\_\_\_\_ By: \_\_\_\_\_  
**Kellyx Nelson, Executive Director**  
**San Mateo Resource Conservation District**

**EXHIBIT D**  
**Insurance Requirements for Contract Construction Services**

CONTRACTOR shall procure and maintain for the duration of this Agreement insurance against claims and injuries to persons or damages to property which may arise from or in connection with the work hereunder by CONTRACTOR, its agents, representatives, employees or subcontractors. The cost of such insurance shall be the sole responsibility of CONTRACTOR.

1. Minimum Scope of Coverage and Limits of Insurance:
  - a. Comprehensive General Liability: \$1,000,000 combined single limit per occurrence for bodily injury, personal injury and property damage.
  - b. Automobile Liability: \$500,000 combined single limit per accident for bodily injury and property damage.
  - c. Worker's Compensation: Limits as set forth in the Labor Code of the State of California.
2. Contractors Liability Insurance Policy shall contain the following clauses:
  - a. RCD, San Mateo County Parks, and California Department of Water Resources are added as an additional insured as respects operation of the named insured formed under contract with RCD.
  - b. It is agreed that any insurance maintained by RCD shall apply in excess of, and not contribute with, insurance provided by this policy.
  - c. The insurer agrees to waive all rights of subrogation against RCD, its officers and employees for losses arising from work performed by CONTRACTOR for RCD.
3. Each insurance policy required herein shall be endorsed to state that coverage shall not be cancelled, limited, or non-renewed except after thirty (30) days written notice has been given to RCD. Certificates of insurance evidencing the coverage required by the clauses set forth above shall be filed with RCD within 10 working days to the effective date of this Agreement.

**EXHIBIT E**  
**Certificate of Compliance**

TO: SAN MATEO RESOURCE CONSERVATION DISTRICT

PROJECT: *[PROJECT NAME]*

This is to certify that all requirements for insurance of subcontractors as specified have been met.

\_\_\_\_\_  
*[Contractor]*

\_\_\_\_\_  
By

\_\_\_\_\_  
Dated

Please return this completed form with your Bonds and Certificates of Insurance within 7 days of notice of award.

## **EXHIBIT F**

### **Labor Compliance Program**

The state labor law requirements applicable to the contract are composed of, but not limited to, the following:

#### **1. Payment of Prevailing Wage Rates**

The award of a public works contract requires that all workers employed on the project be paid not less than the specified general prevailing wage rates by the contractor and its subcontractors. Prevailing wage determinations for this project can be obtained at: **www.dir.ca.gov**. This includes a total package including fringe benefits and training contributions which are paid to the employee or for the benefit of the employee to a bona fide ERISA approved or otherwise unconditionally paid for the benefit of the employee Trust Fund.

The contractor is responsible for obtaining and complying with all applicable general prevailing wage rates for trades workers and any rate changes, which may occur during the term of the contract. Prevailing wage rates and rate changes are to be posted at the job site for workers to view. Or the contractor may post a notice stating where the prevailing wage determinations are available on the jobsite and the contractor shall provide access to such information upon reasonable notice.

2. All individuals or companies performing prevailing wage work on this project must be registered as a public works contractor and pay an annual fee of \$300 to the Department of Industrial Relations (DIR). This includes all work covered by prevailing wage such as trucking, surveying, building inspection and so on.

#### **3. Apprentices**

It is the duty of the contractor and subcontractors to employ registered apprentices on public works projects per Labor Code Section 1777.5; Contractors and subcontractors must submit proof of Public Works Contract Award Information (DAS140) or other documentation for Division of Apprenticeship Standards approved apprenticeship programs. Apprentices are to be employed in all crafts and in all trades with approved training programs. Contractors are to employ apprentices on a ratio of 1 apprentice hour for every 5 journeymen hours or as otherwise approved by the DAS approved Apprenticeship Training Committee. Contractors and subcontractors who do not meet this ratio must submit documentation that apprentices were requested and were not provided and/or not available in sufficient number to meet this ratio. The submission of an accurate DAS142(s) meets this requirement. Additional documentation may be required to verify the apprenticeship status of employees.

#### **4. Penalties**

Penalties, including forfeitures and debarment, shall be imposed for contractor/subcontractor failure to pay prevailing wages, failure to maintain and submit accurate certified payroll records upon request, failure to employ apprentices, and for failure to pay employees for all hours worked at the correct prevailing wage rate, in accordance with Labor Code Sections 1775, 1776, 1777.7, and 1813. Monetary penalties of \$200 per day per worker shall be imposed for failure to pay correct prevailing wage; \$25 per day per worker shall be imposed for overtime violated; \$100 per day per worker for failure to provide certified payroll information; \$100-\$300 per calendar day for noncompliance of Apprenticeship issues.

#### **5. Certified Payroll Records**

Per Labor Code Section 1776, contractors and subcontractors are required to keep accurate payroll records which reflect the name, address, social security number, and work classification of each employee; the straight time and overtime hours worked each day and each week; the fringe benefits; and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee hired in

connection with a public works project. A listing of all current prevailing wage determinations can be obtained from the Agency's main office or by accessing the Department of Industrial Relations' website at: [www.dir.ca.gov](http://www.dir.ca.gov)

Employee payroll records shall be certified (signed under penalty of perjury by someone in authority at the company) and shall be made available for inspection at all reasonable hours at the principal office of the contractor/subcontractor, or shall be furnished to any employee, or to his or her authorized representative on request. Disclosure of certified payroll information to anyone other than the Awarding Body, its agent, or the Department of Industrial Relations requires that personal information about the employees (name, address and social security number) listed on the forms be redacted (omitted) to protect employee privacy.

Contractors and subcontractors shall maintain their certified payrolls on a weekly basis and shall submit said payrolls on a monthly basis in conjunction with contractor's requests progress or final payment. In the event that there has been no work performed during a given week, the Certified Payroll Record shall be annotated "No Work" for that week. The Agency or its authorized representative is also authorized to request and review all related payroll records such as time cards, cancelled checks, etc. For all projects awarded after April 1, 2015, certified payrolls must also be submitted to the DIR electronically through their eCPR system.

While the DIR accepts electronic versions of your certified payroll, the DIR and this agency may also request copies of the original certified payroll and supporting documentation at any time.

#### 6. Nondiscrimination in Employment

Prohibitions against employment discrimination are contained in Labor Code Sections 1735 and 1777.6; the Government Code; the Public Contracts Code; and Title VII of the Civil Rights Act of 1964, as amended. All contractors and subcontractors are required to implement equal employment opportunities as delineated below:

##### a. Equal Employment Poster

The equal employment poster shall be posted at the job site in a conspicuous place visible to employees and employment applicants for the duration of the project. All other labor and employment related posters are also to be properly displayed on the jobsite.

#### 7. Kickback Prohibited

Per Labor Code Section 1778, contractors and subcontractors are prohibited from accepting, taking wages illegally, or extracting "kickback" from employee wages;

#### 8. Acceptance of Fees Prohibited

Contractors and subcontractors are prohibited from exacting any type of fee for registering individuals for public work (Labor Code Section 1779); or for filling work orders on public works contracts (Labor Code Section 1780);

#### 9. Listing of Subcontractors

Contractors are required to list all subcontractors hired to perform work on a public works project when that work is equivalent to more than one-half of one percent of the total contract amount or \$10,000 whichever is greater. (Public Contract Code Section 4100, et seq.);

#### 10. Proper Licensing

Contractors and subcontractors are required to be properly licensed. Penalties will be imposed for employing workers while unlicensed (Labor Code Section 1021 and Business and Professions Code Section 7000, et seq. under California Contractors License Law);

11. Unfair Competition Prohibited

Contractors and subcontractors are prohibited from engaging in unfair competition (Business and Professions Code Sections 17200-17208);

12. Workers' Compensation Insurance

All contractors and subcontractors are required to be insured against liability for workers' compensation, or to undertake self-insurance in accordance with the provisions of Labor Code Section 3700 (Labor Code Section 1861);

13. OSHA

Contractors and subcontractors are required to comply with the Occupational, Safety and Health laws and regulations applicable to the particular public works project.

14. Prompt Payment of Subcontractors and Suppliers

Contractors are required by law to promptly pay their subcontractors and suppliers within seven (7) days of receipt of any progress or final payment from the Public Agency. Likewise the subcontractor and supplier are required to pay their respective subcontractors and suppliers within seven (7) days of receipt of payment from the general contractor. When the payment to the contractor is a release of final retention on the project, those funds must be paid within seven (7) days of receipt.

15. IRCA

Pursuant to the Immigration Reform and Control Act of 1986, employers are required to verify that all employees working on public works contracts are legally able to work in the United States. Employers shall keep on file appropriate I-9 forms and documentation for all workers employed on the jobsite and make such forms available to inspection and review by the LCO upon request.

16. Jobsite Interviews

Jobsite interviews are required on a regular basis on this project, CCMI may conduct random jobsite interviews as necessary to meet labor compliance obligations. Please contact Field Representative Christina Sanchez once project has a confirmed start date. Her phone number is (650) 759-9891.

17. Certification of Electricians

Those employing electricians must comply with employment testing and certification requirements for electricians. Additional information may be required to verify the certification status of those employed.

18. Employee Wage Statements - It is required to provide itemized wage statements (pay stubs) to Employees under Labor Code Section 226.

19. Posting of Labor Compliance – Notice of Labor Compliance Approval is required to be posted at the job site in accordance with section 16429, listing a telephone number to call for inquiries, questions, or assistance with regard to the Labor Compliance Program. (Sample attached in handout).

20. Confirmation of Payroll Records – Confirmation of payment to employees for each contractor and subcontractor shall be undertaken randomly for at least one worker for at least one weekly period within that month. This will entail a monthly request of the front and back of a canceled check and employee

pay stub for each contractor/subcontractor. Per Title 8 of the California Code Regulations section 16432(c).

21. Public Works Contractor Registration – Only those businesses who have registered and paid the applicable fee to the Department of Industrial Relations as a Public Works Contractor will be allowed to work on the project.

I acknowledge that I have been informed and am aware of the foregoing requirements and that I am authorized to make this certification on behalf of \_\_\_\_\_.  
(Name of Contractor)

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**Signature**

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**Name**

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**Title of Contractor Authorized Representative**

**EXHIBIT G**  
**Billing Instructions for Contractors**

**Process and timing**

Upon receipt, invoices will be reviewed by the San Mateo Resource Conservation District (RCD) project manager for completeness and accuracy before submittal to the project funder (San Mateo County Parks Department and DWR). If additional information or corrections are needed, the project manager will request a revised invoice from the Contractor to submit to the project funder. RCD will mail payment to the Contractor within 30 days of receipt of payment by the RCD from the project funder.

**Format**

In order to be paid promptly, you should use the attached invoice template, or include all elements in the template on your invoice.

**Task:** If your contract or work order shows that you will be performing more than one task specified in the budget, please break down the charges on your invoice by task.

**Description:** Provide a thorough but concise description of all work included on the invoice. Include a breakdown by task of equipment and labor rates, hours and dates worked, materials, subcontractors and other costs.

**Please submit your invoice electronically to:**

Jarrad Fisher, Project Manager

[jarrad@sanmateoRCD.org](mailto:jarrad@sanmateoRCD.org),

Subject: Huckleberry Flat Pipeline Project Invoice #