

City of San Diego

CONTRACTOR'S NAME: James W. Fowler Co.

ADDRESS: 12775 Westview Dr., Dallas, OR 97338

TELEPHONE NO.: 503-623-5373

FAX NO.:

CITY CONTACT: Brittany Friedenreich, Senior Contract Specialist, Email: BFriedenreic@sandiego.gov

Phone No. (619) 533-3104

M. Kargar / R. Bustamante / C. Catapia

BIDDING DOCUMENTS



FOR

MONTEZUMA PPL/MID-CITY PIPELINE PH2 AND 70TH-ALVARADO TO SARANAC-SIDEWALK

BID NO.: K-19-1821-DBB-3
SAP NO. (WBS/IO/CC): S-11026, B-17065
CLIENT DEPARTMENT: 2000, 2116
COUNCIL DISTRICT: 7, 9
PROJECT TYPE: KA, IK

THIS CONTRACT WILL BE SUBJECT TO THE FOLLOWING:

- PHASED-FUNDING
- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM
- ELIGIBLE FOR JOINT VENTURE PREQUALIFICATION STATUS (see Instructions to Bidders)
- PREVAILING WAGE RATES: STATE FEDERAL
- SKILLED AND TRAINED WORKFORCE
- APPRENTICESHIP

BID DUE DATE:

2:00 PM

MAY 7, 2019

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



3/26/2019

Seal:



Registered Engineer
(Montezuma PPL/Mid-City Pipeline Ph 2)

Date



3/26/19

Seal:



For City Engineer
(Montezuma PPL/Mid-City Pipeline Ph 2)

Date

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



3/26/2019

Seal:

Registered Engineer
For City Engineer (70th-Alvarado to Saranac-Sidewalk)

Date



TABLE OF CONTENTS

SECTION	PAGE
1. NOTICE INVITING BIDS	5
2. INSTRUCTIONS TO BIDDERS	10
3. PERFORMANCE AND PAYMENT BONDS	21
4. ATTACHMENTS:	
A. SCOPE OF WORK.....	24
B. PHASED FUNDING PROVISIONS	27
C. RESERVED.....	30
D. PREVAILING WAGE.....	31
E. SUPPLEMENTARY SPECIAL PROVISIONS.....	36
TECHNICALS	77
1. Appendix A – Final Mitigated Negative Declaration, Notice of Determination and Notice of Exemption	297
2. Appendix B - Fire Hydrant Meter Program.....	370
3. Appendix C - Materials Typically Accepted by Certificate of Compliance.....	384
4. Appendix D - Sample City Invoice with Cash Flow Forecast.....	386
5. Appendix E - Location Maps	389
6. Appendix F - SWPPP Construction BMP Maintenance Log.....	392
7. Appendix G - Contractor’s Daily Quality Control Inspection Report	395
8. Appendix H - Monthly Drinking Water Discharge Monitoring Form.....	398
9. Appendix I - Caltrans Permit.....	401
10. Appendix J - Caltrans Encroachment Permit Guidelines and Specifications.....	405
11. Appendix K - Hazardous Waste Label and Forms	429
12. Appendix L - Long-Term Maintenance and Monitoring Agreement	435
13. Appendix M - Sample Archaeology Invoice	453
14. Appendix N - Sample of Public Notice.....	456
15. Appendix O - Advanced Metering Infrastructure (AMI) Device Protection	458
16. Appendix P - OSHA Classification Mid City	465
F. RESERVED.....	470
G. CONTRACT AGREEMENT	471
5. CERTIFICATIONS AND FORMS.....	474

NOTICE INVITING BIDS

1. **SUMMARY OF WORK:** This is the City of San Diego's (City) solicitation process to acquire Construction services for **Montezuma PPL/Mid-City Pipeline Ph2 and 70th-Alvarado to Saranac-Sidewalk**. For additional information refer to Attachment A.
2. **FULL AND OPEN COMPETITION:** This solicitation is subject to full and open competition and may be bid by Contractors on the City's approved Prequalified Contractors List. For information regarding the Contractors Prequalified list visit the City's web site: <http://www.sandiego.gov>.
3. **ESTIMATED CONSTRUCTION COST:** The City's estimated construction cost for Montezuma PPL/Mid-City Pipeline Ph 2 project is **\$40,337,000** and 70th Alvarado to Saranac-Sidewalk project is **\$182,000** for an estimated total of **\$40,519,000**.
4. **BID DUE DATE AND TIME ARE: MAY 7, 2019 at 2:00 PM**
5. **PREVAILING WAGE RATES APPLY TO THIS CONTRACT:** Refer to Attachment D.
6. **LICENSE REQUIREMENT:** To be eligible for award of this contract, Prime contractor must possess the following licensing classification: **Class A**
 - 6.1. **ADDITIONAL LICENSE REQUIREMENTS:** All observation wells or piezometers shall be installed by **C-57** well drilling contractors. See also additional **C-27** requirements in the Long Term Maintenance and Monitoring Agreement (LTMMA).
7. **SKILLED AND TRAINED WORKFORCE LABOR REQUIREMENTS:**
 - 7.1. The Contractor and its subcontractors at every tier shall use a skilled and trained workforce to perform all work on the project or contract that falls within an apprenticeable occupation in the building and construction trades, as set forth in 8California Public Contract Code section 2601, including the exceptions in sections 2601(d)(5) and 2601 (d)(6). Contractor shall provide to the City a report demonstrating compliance with this section on a monthly basis, to be included with monthly pay requests. The City may withhold progress payments or retention in accordance with California Public Contract Code section 2602(b) if the Contractor fails to provide the monthly report required by this section, provides a report that is incomplete, or provides a report that does not demonstrate compliance with this section. Payment may be withheld until the Contractor provides a plan to achieve substantial compliance with this section prior to completion of the contract that is acceptable to the City, with respect to the relevant apprenticeable occupation.

This section references provisions of the California Public Contract Code for convenience only. The City is not electing to incorporate other provisions of Chapter 2.9 of the California Public Contract Code not referenced herein, including but not limited to provisions for State enforcement. Instead, failure to comply with this section is considered a material breach of this contract which could affect the Contractor's

ability to perform future work for the City pursuant to Chapter 2, Article 2, Division 8 of the San Diego Municipal Code regarding debarment.

7.2. Submittal Requirements

Contracts must submit proof of a Commitment to Comply with Skilled and Trained Workforce Requirements at bid due date. Contractor and its subcontractors at every tier will use a skilled and trained workforce to perform all work on the project or a contract that falls within an apprenticeship occupation in the building and construction trades in accordance with Chapter 2.9 (commencing with Section 2600) of Part 1 of Division 2 of the Public Contract Code. City will monitor Contractor's compliance with these requirements and Contractor, on behalf of itself and its subcontractors at every tier, shall provide on a monthly basis a Skilled and Trained Workforce Certification Form and Skilled and Trained Workforce Monthly Compliance Report demonstrating compliance. If the monthly Skilled and Trained Workforce Certification Form and Monthly Compliance Report are not provided within 30 days or if Contractor provides a report that is incomplete, City shall withhold further payments until a complete report is provided. If the Skilled and Trained Workforce Certification form does not establish compliance with Section 132354.7, City shall withhold further payments until Contractor provides a plan to achieve substantial compliance with the skilled and trained workforce requirements, with respect to the relevant apprenticeable occupation, prior to the completion of the project. Any withholding will be released for payment on the monthly estimate for partial payments next following the date that all the satisfactory compliance of the requirements for which the retention was made are submitted.

8. VETERANS OUTREACH:

Military veterans bring unique skills to City projects due to their mission-oriented training and experience, and dedication to the job. The City desires to facilitate the entry into the building and construction trades for veterans interested in careers in the industry. Within (30) days after notice that it is the apparent low bidder. Contractor shall contact "Helmets to Hardhats" or "UA Veterans in Piping" on behalf of itself and its subcontractors, for potential job referrals and employment of veterans on the project. Contractor may contact other veterans programs in its discretion, but if neither of the above referenced programs are contacted, the Contractor must receive prior written approval from the City that it is an equivalent veterans program. Contacting multiple veterans programs is highly encouraged, but not required. Within ninety (90) days after issuance of a Notice to Proceed for construction of the project. Contractor shall provide the City with a written report detailing the veterans programs contacted, opportunities offered by the Contractor and its subcontractors, applications received and for what construction trades, and how many veterans were hired through the programs. Hiring veterans to work on the project is not mandatory, but information received from the Contractor may be used by the City in the future to develop a veteran's outreach program for City contracting.

9. BUSINESS COOPERATION TAX PROGRAM:

You must exercise your right to obtain a California State of Board of Equalization (BOE) sub-permit for the jobsite and allocate all eligible Bradley-Burns Uniform Local Sales and Use Tax (Use Tax) to the City. In addition, you will ensure that all eligible subcontractors will exercise their right to obtain this BOE sub-submit and allocate all eligible Use Tax to the City. The City will not issue a notice to proceed unless you and your eligible subcontractors have obtained this sub-permit from the BOE. More information on obtaining this permit can be found by contacting the local BOE office.

10. SUBCONTRACTING PARTICIPATION PERCENTAGES: Subcontracting participation percentages apply to this contract.

10.1. The City has incorporated **mandatory** SLBE-ELBE subcontractor participation percentages to enhance competition and maximize subcontracting opportunities. For the purpose of achieving the mandatory subcontractor participation percentages, a recommended breakdown of the SLBE and ELBE subcontractor participation percentages based upon certified SLBE and ELBE firms has also been provided to achieve the mandatory subcontractor participation percentages:

- | | |
|----------------------------------|--------------|
| 1. SLBE participation | 9.1% |
| 2. ELBE participation | 13.2% |
| 3. Total mandatory participation | 22.3% |

10.2. The Bid may be declared non-responsive if the Bidder fails to meet the following requirements:

10.2.1. Include SLBE-ELBE certified subcontractors at the overall mandatory participation percentage identified in this document; **OR**

10.2.2. Submit Good Faith Effort documentation, saved in searchable Portable Document Format (PDF) and stored on Compact Disc (CD) or Digital Video Disc (DVD), demonstrating the Bidder made a good faith effort to outreach to and include SLBE-ELBE Subcontractors required in this document within 3 Working Days of the Bid opening if the overall mandatory participation percentage is not met.

11. AWARD PROCESS:

11.1. The Award of this contract is contingent upon the Contractor's compliance with all conditions of Award as stated within these documents and within the Notice of Intent to Award.

11.2. Upon acceptance of bids and determination of the apparent low bidder, the City will prepare the contract documents for execution within approximately 21 days of the date of the bid opening. The City will then award the contract upon receipt of properly signed Contract, bonds, and insurance documents.

- 11.3. This contract will be deemed executed and effective only upon the signing of the Contract by the Mayor or his designee and approval as to form by the City Attorney's Office.
- 11.4. The low Bid will be determined by the Base Bid plus all the Alternates.
- 11.5. Once the low bid has been determined, the City may, at its sole discretion, award the contract for the Base Bid alone; or for the Base Bid plus one or more alternates.

12. SUBMISSION OF QUESTIONS:

- 12.1. The Director (or Designee) of Public Works Department is the officer responsible for opening, examining, and evaluating the competitive Bids submitted to the City for the acquisition, construction and completion of any public improvement except when otherwise set forth in these documents. Any questions related to this solicitation shall be submitted to:

Public Works Contracts
525 B Street, Suite 750 (7th Floor)
San Diego, California, 92101
Attention: Brittany Friedenreich

OR:

BFriedenreic@sandiego.gov

- 12.2. Questions received less than 14 days prior to the date for opening of Bids may not be considered.
- 12.3. Questions or clarifications deemed by the City to be material shall be answered via issuance of an addendum and posted to the City's online bidding service.
- 12.4. Only questions answered by formal written addenda shall be binding. Oral and other interpretations or clarifications shall be without legal effect. It is the Bidder's responsibility to be informed of any addenda that have been issued and to include all such information in its Bid.

- 13. **SUPPLEMENTAL AGREEMENTS:** Supplemental agreements attached to this contract for items of Work such as revegetation maintenance and monitoring shall be signed by the BIDDER at time of award of the primary BID. The signed agreements shall be accompanied by the proper bonds and insurance as specified in 1-7.2, "CONTRACT BONDS," 5-4, "INSURANCE". Bonds shall be in the amount of the total Contract Price for all Work including the supplemental agreements.

- 13.1. **Partial Release of Performance Bond and Labor and Materialmen's Bond:** For information regarding partial release of bonds for this Contract, see Supplementary Special Provisions, **Appendix L - Long-Term Maintenance and Monitoring Agreement.**

14. PHASED FUNDING: For Phased Funding Conditions, see Attachment B.

15. ADDITIVE/DEDUCTIVE ALTERNATES:

15.1. The additive/deductive alternates have been established to allow the City to compare the cost of specific portions of the Work with the Project's budget and enable the City to make a decision whether to incorporate these portions prior to award. The award will be established as described in the Bid. The City reserves the right to award the Contract for the Base Bid only or for the Base Bid plus one or more Alternates.

15.2. For water pipeline projects, the Plans typically show all cut and plug and connection work to be performed by City Forces. However, Bidders shall refer to Bidding Documents to see if all or part of this work will be performed by the Contractor.

INSTRUCTIONS TO BIDDERS

1. PREQUALIFICATION OF CONTRACTORS:

- 1.1. Contractors submitting a Bid must be pre-qualified for the total amount proposed, including all alternate items, prior to the date of submittal. Bids from contractors who have not been pre-qualified as applicable and Bids that exceed the maximum dollar amount at which contractors are pre-qualified may be deemed **non-responsive** and ineligible for award.
- 1.2. The completed application must be submitted online no later than 2 weeks prior to the bid opening.
- 1.3. **Joint Venture Bidders Cumulative Maximum Bidding Capacity:** For projects with an engineer's estimate of \$30,000,000 or greater, Joint Ventures submitting bids may be deemed responsive and eligible for award if the cumulative maximum bidding capacity of the individual Joint Venture entities is equal to or greater than the total amount proposed.
 - 1.3.1. Each of the entities of the Joint Venture must have been previously prequalified at a minimum of \$15,000,000.
 - 1.3.2. Bids submitted with a total amount proposed of less than \$30,000,000 are not eligible for Cumulative Maximum Bidding Capacity prequalification. To be eligible for award in this scenario, the Joint Venture itself or at least one of the Joint Venture entities must have been prequalified for the total amount proposed.
 - 1.3.3. Bids submitted by Joint Ventures with a total amount proposed of \$30,000,000 or greater on a project with an engineer's estimate of less than \$30,000,000 are not eligible for Cumulative Maximum Bidding Capacity prequalification.
 - 1.3.4. The Joint Venture designated as the Apparent Low Bidder shall provide evidence of its corporate existence and furnish good and approved bonds in the name of the Joint Venture within 14 Calendar Days of receipt by the Bidder of a form of contract for execution.
- 1.4. Complete information and links to the on-line prequalification application are available at:

<http://www.sandiego.gov/cip/bidopps/prequalification>

- 1.5. Due to the City's responsibility to protect the confidentiality of the contractors' information, City staff will not be able to provide information regarding contractors' prequalification status over the telephone. Contractors may access real-time information about their prequalification status via their vendor profile on [PlanetBids™](#).
2. **ELECTRONIC FORMAT RECEIPT AND OPENING OF BIDS:** Bids will be received in electronic format (eBids) EXCLUSIVELY at the City of San Diego's electronic bidding (eBidding) site, at: <http://www.sandiego.gov/cip/bidopps/index.shtml> and are due by the date, and time shown on the cover of this solicitation.
 - 2.1. **BIDDERS MUST BE PRE-REGISTERED** with the City's bidding system and possess a system-assigned Digital ID in order to submit and electronic bid.
 - 2.2. The City's bidding system will automatically track information submitted to the site including IP addresses, browsers being used and the URLs from which information was submitted. In addition, the City's bidding system will keep a history of every login instance including the time of login, and other information about the user's computer configuration such as the operating system, browser type, version, and more. Because of these security features, Contractors who disable their browsers' cookies will not be able to log in and use the City's bidding system.
 - 2.3. The City's electronic bidding system is responsible for bid tabulations. Upon the bidder's or proposer's entry of their bid, the system will ensure that all required fields are entered. **The system will not accept a bid for which any required information is missing.** This includes all necessary pricing, subcontractor listing(s) and any other essential documentation and supporting materials and forms requested or contained in these solicitation documents.
 - 2.4. **BIDS REMAIN SEALED UNTIL BID DEADLINE.** eBids are transmitted into the City's bidding system via hypertext transfer protocol secure (https) mechanism using SSL 128-256 bit security certificates issued from Verisign/Thawte which encrypts data being transferred from client to server. Bids submitted prior to the "Bid Due Date and Time" are not available for review by anyone other than the submitter who has until the "Bid Due Date and Time" to change, rescind or retrieve its proposal should it desire to do so.
 - 2.5. **BIDS MUST BE SUBMITTED BY BID DUE DATE AND TIME.** Once the bid deadline is reached, no further submissions are accepted into the system. Once the Bid Due Date and Time has lapsed, bidders, proposers, the general public, and City staff are able to immediately see the results on line. City staff may then begin reviewing the submissions for responsiveness, EOCP compliance and other issues. The City may require any Bidder to furnish statement of experience, financial responsibility, technical ability, equipment, and references.

2.6. RECAPITULATION OF THE WORK. Bids shall not contain any recapitulation of the Work. Conditional Bids may be rejected as being non-responsive. Alternative proposals will not be considered unless called for.

2.7. BIDS MAY BE WITHDRAWN by the Bidder only up to the bid due date and time.

2.7.1. Important Note: Submission of the electronic bid into the system may not be instantaneous. Due to the speed and capabilities of the user's internet service provider (ISP), bandwidth, computer hardware and other variables, it may take time for the bidder's submission to upload and be received by the City's eBidding system. It is the bidder's sole responsibility to ensure their bids are received on time by the City's eBidding system. The City of San Diego is not responsible for bids that do not arrive by the required date and time.

2.8. ACCESSIBILITY AND AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE: To request a copy of this solicitation in an alternative format, contact the Public Works Contract Specialist listed on the cover of this solicitation at least five (5) working days prior to the Bid/Proposal due date to ensure availability.

3. ELECTRONIC BID SUBMISSIONS CARRY FULL FORCE AND EFFECT

3.1. The bidder, by submitting its electronic bid, acknowledges that doing so carries the same force and full legal effect as a paper submission with a longhand (wet) signature.

3.2. By submitting an electronic bid, the bidder certifies that the bidder has thoroughly examined and understands the entire Contract Documents (which consist of the plans and specifications, drawings, forms, affidavits and the solicitation documents), and that by submitting the eBid as its bid proposal, the bidder acknowledges, agrees to and is bound by the entire Contract Documents, including any addenda issued thereto, and incorporated by reference in the Contract Documents.

3.3. The Bidder, by submitting its electronic bid, agrees to and certifies under penalty of perjury under the laws of the State of California, that the certification, forms and affidavits submitted as part of this bid are true and correct.

3.4. The Bidder agrees to the construction of the project as described in Attachment "A-Scope of Work" for the City of San Diego, in accordance with the requirements set forth herein for the electronically submitted prices. The Bidder guarantees the Contract Price for a period of 120 days from the date of Bid opening. The duration of the Contract Price guarantee shall be extended by the number of days required for the City to obtain all items necessary to fulfill all conditions precedent.

4. BIDS ARE PUBLIC RECORDS: Upon receipt by the City, Bids shall become public records subject to public disclosure. It is the responsibility of the respondent to clearly identify any confidential, proprietary, trade secret or otherwise legally privileged information contained within the Bid. General references to sections of the California Public Records Act (PRA) will

not suffice. If the Contractor does not provide applicable case law that clearly establishes that the requested information is exempt from the disclosure requirements of the PRA, the City shall be free to release the information when required in accordance with the PRA, pursuant to any other applicable law, or by order of any court or government agency, and the Contractor will hold the City harmless for release of this information.

5. CONTRACTOR REGISTRATION AND ELECTRONIC REPORTING SYSTEM:

5.1. **Prior** to the Award of the Contract or Task Order, you and your Subcontractors and Suppliers must register with the City’s web-based vendor registration and bid management system. For additional information go to:

<http://www.sandiego.gov/purchasing/bids-contracts/vendorreg>

5.2. The City may not award the contract until registration of all subcontractors and suppliers is complete. In the event this requirement is not met within the time frame specified in the Notice of Intent to Award letter, the City reserves the right to rescind the Notice of Award / Intent to Award and to make the award to the next responsive and responsible bidder / proposer.

6. JOINT VENTURE CONTRACTORS: Provide a copy of the Joint Venture agreement and the Joint Venture license to the City within 14 Calendar Days after receiving the Contract forms.

7. INSURANCE REQUIREMENTS:

7.1. All certificates of insurance and endorsements required by the contract are to be provided upon issuance of the City’s Notice of Intent to Award letter.

7.2. Refer to sections 5-4, “INSURANCE” of the Supplementary Special Provisions (SSP) for the insurance requirements which must be met.

8. REFERENCE STANDARDS: Except as otherwise noted or specified, the Work shall be completed in accordance with the following standards:

Title	Edition	Document Number
Standard Specifications for Public Works Construction (“The GREENBOOK”) http://www.greenbookspecs.org/	2018	PWPI010119-01
City of San Diego Standard Specifications for Public Works Construction (“The WHITEBOOK”)* https://www.sandiego.gov/publicworks/edocref/greenbook	2018	PWPI010119 -02
City of San Diego Standard Drawings* https://www.sandiego.gov/publicworks/edocref/standarddraw	2018	PWPI010119 -03
Citywide Computer Aided Design and Drafting (CADD) Standards https://www.sandiego.gov/publicworks/edocref/drawings	2018	PWPI010119 -04

Title	Edition	Document Number
California Department of Transportation (CALTRANS) Standard Specifications – http://www.dot.ca.gov/des/oe/construction-contract-standards.html	2018	PWPI030119-05
CALTRANS Standard Plans http://www.dot.ca.gov/des/oe/construction-contract-standards.html	2018	PWPI030119-06
California Manual on Uniform Traffic Control Devices Revision 3 (CA MUTCD Rev 3) http://www.dot.ca.gov/trafficops/camutcd/	2014	PWPI030119-07
<p>NOTE: *Available online under Engineering Documents and References at: http://www.sandiego.gov/publicworks/edocref/index.shtml</p> <p>*Electronic updates to the Standard Drawings may also be found in the link above</p>		

9. **CITY'S RESPONSES AND ADDENDA:** The City, at its discretion, may respond to any or all questions submitted in writing via the City's eBidding web site in the **form of an addendum**. No other responses to questions, oral or written shall be of any force or effect with respect to this solicitation. The changes to the Contract Documents through addenda are made effective as though originally issued with the Bid. The Bidders shall acknowledge the receipt of Addenda at the time of bid submission.
10. **CITY'S RIGHTS RESERVED:** The City reserves the right to cancel the Notice Inviting Bids at any time, and further reserves the right to reject submitted Bids, without giving any reason for such action, at its sole discretion and without liability. Costs incurred by the Bidder(s) as a result of preparing Bids under the Notice Inviting Bids shall be the sole responsibility of each bidder. The Notice Inviting Bids creates or imposes no obligation upon the City to enter a contract.
11. **CONTRACT PRICING:** This solicitation is for a Lump Sum contract with Unit Price provisions as set forth herein. The Bidder agrees to perform construction services for the City of San Diego in accordance with these contract documents for the prices listed below. The Bidder further agrees to guarantee the Contract Price for a period of 120 days from the date of Bid opening. The duration of the Contract Price guarantee may be extended, by mutual consent of the parties, by the number of days required for the City to obtain all items necessary to fulfill all contractual conditions.
12. **SUBCONTRACTOR INFORMATION:**
- 12.1. **LISTING OF SUBCONTRACTORS.** In accordance with the requirements provided in the "Subletting and Subcontracting Fair Practices Act" of the California Public Contract Code, the Bidder shall provide the **NAME** and **ADDRESS** of each Subcontractor who will perform work, labor, render services or who specially fabricates and installs a portion [type] of the work or improvement, in an amount in excess of 0.5% of the

Contractor's total Bid. The Bidder shall also state within the description, whether the subcontractor is a **CONSTRUCTOR, CONSULTANT** or **SUPPLIER**. The Bidder shall state the **DIR REGISTRATION NUMBER** for all subcontractors and shall further state within the description, the **PORZION** of the work which will be performed by each subcontractor under this Contract. The Contractor shall list only one Subcontractor for each portion of the Work. The **DOLLAR VALUE** of the total Bid to be performed shall be stated for all subcontractors listed. Failure to comply with this requirement may result in the Bid being rejected as **non-responsive** and ineligible for award. The Bidder's attention is directed to the Special Provisions - Section 3-2, "SELF-PERFORMANCE", which stipulates the percent of the Work to be performed with the Bidders' own forces. The Bidder shall list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors for which Bidders are seeking recognition towards achieving any mandatory, voluntary (or both) subcontracting participation goals.

Additionally, pursuant to California Senate Bill 96 and in accordance with the requirements of Labor Code sections 1771.1 and 1725.5, by submitting a bid or proposal to the City, Contractor is certifying that he or she has verified that all subcontractors used on this public work project are registered with the California Department of Industrial Relations (DIR). **The Bidder shall provide the name, address, license number, DIR registration number of any Subcontractor - regardless of tier** - who will perform work, labor, render services or specially fabricate and install a portion [type] of the work or improvement pursuant to the contract.

12.2. LISTING OF SUPPLIERS. Any Bidder seeking the recognition of Suppliers of equipment, materials, or supplies obtained from third party Suppliers towards achieving any mandatory or voluntary (or both) subcontracting participation goals shall provide, at a minimum, the **NAME, LOCATION (CITY), DIR REGISTRATION NUMBER** and the **DOLLAR VALUE** of each supplier. The Bidder will be credited up to 60% of the amount to be paid to the Suppliers for materials and supplies unless vendor manufactures or substantially alters materials and supplies, in which case, 100% will be credited. The Bidder is to indicate within the description whether the listed firm is a supplier or manufacturer. If no indication is provided, the listed firm will be credited at 60% of the listed dollar value for purposes of calculating the Subcontractor Participation Percentage.

12.3. LISTING OF SUBCONTRACTORS OR SUPPLIERS FOR ALTERNATES. For subcontractors or suppliers to be used on additive or deductive alternate items, in addition to the above requirements, bidder shall further note "ALTERNATE" and alternate item number within the description.

13. SUBMITTAL OF "OR EQUAL" ITEMS: See Section 4-6, "Trade Names" in The WHITEBOOK and as amended in the SSP.

14. AWARD:

14.1. The Award of this contract is contingent upon the Contractor's compliance with all conditions precedent to Award.

14.2. Upon acceptance of a Bid, the City will prepare contract documents for execution within approximately 21 days of the date of the Bid opening and award the Contract approximately within 7 days of receipt of properly executed Contract, bonds, and insurance documents.

14.3. This contract will be deemed executed and effective only upon the signing of the Contract by the Mayor or his designee and approval as to form the City Attorney's Office.

15. SUBCONTRACT LIMITATIONS: The Bidder's attention is directed to Standard Specifications for Public Works Construction, Section 3-2, "SELF-PERFORMANCE" in The GREENBOOK and as amended in the SSP which requires the Contractor to self-perform not less than the specified amount. Failure to comply with this requirement shall render the bid **non-responsive** and ineligible for award.

16. AVAILABILITY OF PLANS AND SPECIFICATIONS: Contract Documents may be obtained by visiting the City's website: <http://www.sandiego.gov/cip/>. Plans and Specifications for this contract are also available for review in the office of the City Clerk or Public Works Contracts.

17. ONLY ONE BID PER CONTRACTOR SHALL BE ACCEPTED: No person, firm, or corporation shall be allowed to make, file, or be interested in more than one (1) Bid for the same work unless alternate Bids are called for. A person, firm or corporation who has submitted a sub-proposal to a Bidder, or who has quoted prices on materials to a Bidder, is not hereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or from submitting a Bid in its own behalf. Any Bidder who submits more than one bid will result in the rejection of all bids submitted.

18. SAN DIEGO BUSINESS TAX CERTIFICATE: The Contractor and Subcontractors, not already having a City of San Diego Business Tax Certificate for the work contemplated shall secure the appropriate certificate from the City Treasurer, Civic Center Plaza, First floor and submit to the Contract Specialist upon request or as specified in the Contract Documents. Tax Identification numbers for both the Bidder and the listed Subcontractors must be submitted on the City provided forms within these documents.

19. BIDDER'S GUARANTEE OF GOOD FAITH (BID SECURITY) FOR DESIGN-BID-BUILD CONTRACTS:

19.1. For bids \$250,000 and above, bidders shall submit Bid Security at bid time. Bid Security shall be in one of the following forms: a cashier's check, or a properly certified check upon some responsible bank; or an approved corporate surety bond payable to the City of San Diego for an amount of not less than 10% of the total bid amount.

- 19.2. This check or bond, and the monies represented thereby, will be held by the City as a guarantee that the Bidder, if awarded the contract, will in good faith enter into the contract and furnish the required final performance and payment bonds.
- 19.3. The Bidder agrees that in the event of the Bidder's failure to execute this contract and provide the required final bonds, the money represented by the cashier's or certified check will remain the property of the City; and the Surety agrees that it will pay to the City the damages, not exceeding the sum of 10% of the amount of the Bid, that the City may suffer as a result of such failure.
- 19.4. At the time of bid submission, bidders must upload and submit an electronic PDF copy of the aforementioned bid security. Whether in the form of a cashier's check, a properly certified check or an approved corporate surety bond payable to the City of San Diego, the bid security must be uploaded to the City's eBidding system. Within twenty-four (24) hours after the bid due date and time, the first five (5) apparent low bidders must provide the City with the original bid security.
- 19.5. Failure to submit the electronic version of the bid security at the time of bid submission AND failure to provide the original within twenty-four (24) hours may cause the bid to be rejected and deemed **non-responsive**.

20. AWARD OF CONTRACT OR REJECTION OF BIDS:

- 20.1. This contract may be awarded to the lowest responsible and reliable Bidder.
- 20.2. Bidders shall complete ALL eBid forms as required by this solicitation. Incomplete eBids will not be accepted.
- 20.3. The City reserves the right to reject any or all Bids, to waive any informality or technicality in Bids received, and to waive any requirements of these specifications as to bidding procedure.
- 20.4. Bidders will not be released on account of their errors of judgment. Bidders may be released only upon receipt by the City within 3 Working Days of the bid opening, written notice from the Bidder which shows proof of honest, credible, clerical error of a material nature, free from fraud or fraudulent intent; and of evidence that reasonable care was observed in the preparation of the Bid.
- 20.5. A bidder who is not selected for contract award may protest the award of a contract to another bidder by submitting a written protest in accordance with the San Diego Municipal Code.
- 20.6. The City of San Diego will not discriminate in the award of contracts with regard to race, religion creed, color, national origin, ancestry, physical handicap, marital status, sex or age.

20.7. Each Bid package properly signed as required by these specifications shall constitute a firm offer which may be accepted by the City within the time specified herein.

20.8. The City reserves the right to evaluate all Bids and determine the lowest Bidder on the basis of the base bid and any proposed alternates or options as detailed herein.

21. BID RESULTS:

21.1. The availability of the bids on the City's eBidding system shall constitute the public announcement of the apparent low bidder. In the event that the apparent low bidder is subsequently deemed non-responsive or non-responsible, a notation of such will be made on the eBidding system. The new ranking and apparent low bidder will be adjusted accordingly.

21.2. To obtain the bid results, view the results on the City's web site, or request the results by U.S. mail and provide a self-addressed, stamped envelope. If requesting by mail, be sure to reference the bid name and number. The bid tabulations will be mailed to you upon their completion. The results will not be given over the telephone.

22. THE CONTRACT:

22.1. The Bidder to whom award is made shall execute a written contract with the City of San Diego and furnish good and approved bonds and insurance certificates specified by the City within 14 days after receipt by Bidder of a form of contract for execution unless an extension of time is granted to the Bidder in writing.

22.2. If the Bidder takes longer than 14 days to fulfill these requirements, then the additional time taken shall be added to the Bid guarantee. The Contract shall be made in the form adopted by the City, which includes the provision that no claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.

22.3. If the Bidder to whom the award is made fails to enter into the contract as herein provided, the award may be annulled and the Bidder's Guarantee of Good Faith will be subject to forfeiture. An award may be made to the next lowest responsible and reliable Bidder who shall fulfill every stipulation embraced herein as if it were the party to whom the first award was made.

22.4. Pursuant to the San Diego City Charter section 94, the City may only award a public works contract to the lowest responsible and reliable Bidder. The City will require the Apparent Low Bidder to (i) submit information to determine the Bidder's responsibility and reliability, (ii) execute the Contract in form provided by the City, and (iii) furnish good and approved bonds and insurance certificates specified by the City within 14 Days, unless otherwise approved by the City, in writing after the Bidder receives

notification from the City, designating the Bidder as the Apparent Low Bidder and formally requesting the above mentioned items.

22.5. The award of the Contract is contingent upon the satisfactory completion of the above-mentioned items and becomes effective upon the signing of the Contract by the Mayor or designee and approval as to form by the City Attorney's Office. If the Apparent Low Bidder does not execute the Contract or submit required documents and information, the City may award the Contract to the next lowest responsible and reliable Bidder who shall fulfill every condition precedent to award. A corporation designated as the Apparent Low Bidder shall furnish evidence of its corporate existence and evidence that the officer signing the Contract and bond for the corporation is duly authorized to do so.

23. EXAMINATION OF PLANS, SPECIFICATIONS, AND SITE OF WORK: The Bidder shall examine carefully the Project Site, the Plans and Specifications, other materials as described in the Special Provisions, Section 3-9, "TECHNICAL STUDIES AND SUBSURFACE DATA", and the proposal forms (e.g., Bidding Documents). The submission of a Bid shall be conclusive evidence that the Bidder has investigated and is satisfied as to the conditions to be encountered, as to the character, quality, and scope of Work, the quantities of materials to be furnished, and as to the requirements of the Bidding Documents Proposal, Plans, and Specifications.

24. CITY STANDARD PROVISIONS: This contract is subject to the following standard provisions. See The WHITEBOOK for details.

24.1. The City of San Diego Resolution No. R-277952 adopted on May 20, 1991 for a Drug-Free Workplace.

24.2. The City of San Diego Resolution No. R-282153 adopted on June 14, 1993 related to the Americans with Disabilities Act.

24.3. The City of San Diego Municipal Code §22.3004 for Contractor Standards.

24.4. The City of San Diego's Labor Compliance Program and the State of California Labor Code §§1771.5(b) and 1776.

24.5. Sections 1777.5, 1777.6, and 1777.7 of the State of California Labor Code concerning the employment of apprentices by contractors and subcontractors performing public works contracts.

24.6. The City's Equal Benefits Ordinance (EBO), Chapter 2, Article 2, Division 43 of The San Diego Municipal Code (SDMC).

24.7. The City's Information Security Policy (ISP) as defined in the City's Administrative Regulation 90.63.

25. PRE-AWARD ACTIVITIES:

- 25.1.** The contractor selected by the City to execute a contract for this Work shall submit the required documentation as specified in the herein and in the Notice of Award. Failure to provide the information as specified may result in the Bid being rejected as **non-responsive**.
- 25.2.** The decision that bid is non-responsive for failure to provide the information required within the time specified shall be at the sole discretion of the City.

PERFORMANCE BOND, LABOR AND MATERIALMEN'S BOND

FAITHFUL PERFORMANCE BOND AND LABOR AND MATERIALMEN'S BOND:

James W. Fowler Co. _____, a corporation, as principal, and
Liberty Mutual Insurance Company _____, a corporation authorized to do
business in the State of California, as Surety, hereby obligate themselves, their successors and
assigns, jointly and severally, to The City of San Diego a municipal corporation in the sum of **THIRTY
THREE MILLION SIX HUNDRED THIRTY NINE THOUSAND THREE HUNDRED SEVENTY SEVEN
DOLLARS AND TWENTY CENTS (\$33,639,377.20)** for the faithful performance of the annexed
contract, and in the sum of **THIRTY THREE MILLION SIX HUNDRED THIRTY NINE THOUSAND
THREE HUNDRED SEVENTY SEVEN DOLLARS AND TWENTY CENTS (\$33,639,377.20)** for the benefit
of laborers and materialmen designated below.

Conditions:

If the Principal shall faithfully perform the annexed contract with the City of San Diego,
California, then the obligation herein with respect to a faithful performance shall be void; otherwise it
shall remain in full force.

If the Principal shall promptly pay all persons, firms and corporations furnishing materials for
or performing labor in the execution of this contract, and shall pay all amounts due under the
California Unemployment Insurance Act then the obligation herein with respect to laborers and
materialmen shall be void; otherwise it shall remain in full force.

The obligation herein with respect to laborers and materialmen shall inure to the benefit of
all persons, firms and corporations entitled to file claims under the provisions of Article 2. Claimants,
(iii) public works of improvement commencing with Civil Code Section 9100 of the Civil Code of the
State of California.

Changes in the terms of the annexed contract or specifications accompanying same or
referred to therein shall not affect the Surety's obligation on this bond, and the Surety hereby waives
notice of same.

PERFORMANCE BOND, LABOR AND MATERIALMEN'S BOND (continued)

The Surety shall pay reasonable attorney's fees should suit be brought to enforce the provisions of this bond.

Dated August 2, 2019

Approved as to Form

James W. Fowler Co.

Principal

By 

James Fowler

Printed Name of Person Signing for Principal

Mara W. Elliott, City Attorney

By 

Deputy City Attorney

Liberty Mutual Insurance Company

Surety

By 

Jana M. Roy Attorney-in-fact
CA Lic. No. 0155652

Approved:

2233 112th Avenue NE

Local Address of Surety

By 

James Nagelvoort
Director
Public Works Department

Bellevue, WA 98004

Local Address (City, State) of Surety

(425) 709-3600

Local Telephone No. of Surety

Premium \$177,078.00

Bond No. 023211684



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: 8201163-023001

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Guy Armfield, John Claeys, Scott Fisher, Nicholas Fredrickson, Deanna M. French, Scott Garcia, Elizabeth R. Hahn, Roger Kaltenbach, Ronald J. Lange, Andrew P. Larsen, Susan B. Larson, Scott McGilvray, Mindee L. Rankin, Jana M. Roy

all of the city of Bellevue state of Washington each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 29th day of April, 2019.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: David M. Carey, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

State of PENNSYLVANIA ss
County of MONTGOMERY

On this 29th day of April, 2019 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 2 day of August, 2019.



By: Renee C. Llewellyn, Assistant Secretary

ACKNOWLEDGMENT BY SURETY

State of Washington)
County of King)

On this 2nd day of August, 2019, before me, Roger Kaltenbach notary public in and for the State of Washington, with principal office in the County of King, residing therein, duly commissioned and sworn, personally appeared Jana M. Roy, known to me to be the person whose name is subscribed to the within instrument as the attorney-in-fact of Liberty Mutual Insurance Company as surety in said instrument, and acknowledged to me that she subscribed the name of said corporation thereto as surety, and her own name as attorney-in-fact.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.



NOTARY PUBLIC


Commission Expires: 03/17/2022

ATTACHMENTS

ATTACHMENT A
SCOPE OF WORK

SCOPE OF WORK

1. SCOPE OF WORK:

MONTEZUMA PPL/MID-CITY PIPELINE PH 2:

The City's Public Works Department is planning to install roughly 1.0 miles of new water pipeline, which consists of approximately 4,880 linear feet of new 66" diameter CML&TC steel transmission main and 420 linear feet of 8-inch PVC distribution main. Work also includes 2,530 linear feet of 16-inch cast iron pipeline abandonment, as well as, associated required street ADA improvements and paving. The 66-inch transmission main will run southward from the Alvarado Water Treatment Plant (AWTP) to the intersection of 69th and Mohawk Street. The north terminus of the pipeline will be connected to existing Valve Vault No. 3 located where the Earl Thomas Reservoir Outlet Pipeline intersects the Clear Wells Interconnection Pipeline. The south terminus will connect to the Mid-City Phase 2A Pipeline just easterly of the 69th and Mohawk Street intersection. Additionally, in the Helix Water District, Work also includes the relocation and construction of a new 8-inch PVC Distribution Main running along Lake Murray Blvd north of Wisconsin Ave, its Water services, and all other work shown on plans and specifications. Lastly, in the City of La Mesa, work includes the removal of an 8-inch Sewer pipeline and manholes and replacing them with new as shown on the plans and specifications.

ALTERNATE A:

If Alternate A is awarded, the contractor shall perform additional Work on the replacement of 8-inch Cast Iron Sewer Line within the City of La Mesa ROW in accordance to the Bid Schedule and Plans numbered **37333-78-D** through **37333-81-D (LM-1 through LM-4)** for the **Montezuma PPL/Mid-City Pipeline Ph2** project.

ALTERNATE B:

If Alternate B is awarded, the contractor shall deduct overlay and striping Work within the City of La Mesa ROW originally shown in the base Bid for **Montezuma PPL/Mid-City Pipeline Ph2** in accordance to the Bid Schedule.

70TH-ALVARADO TO SARANAC-SIDEWALK:

This portion of the project proposes to install new concrete sidewalk on the west side of 70th street between Alvarado Road and Saranac Street. The work is to include installation of new 4' and 5' wide concrete sidewalk, curb and gutter, retaining walls, pedestrian push buttons, chain link fencing, bike lane striping, traffic and signing, and relocation/adjustment of pedestrian barricade and signs.

- 1.1. The Work shall be performed in accordance with:
- 1.1.1. The Notice Inviting Bids and Plans numbered **37333-01-D** through **37333-89-D**, inclusive, and Traffic Control Plans numbered **37333-T1-D** through **37333-T71-D**, for Montezuma PPL/Mid-City Pipeline Ph 2 inclusive.
 - 1.1.2. The Notice Inviting Bids and Plans numbered **40522-01-D** through **40522-07-D** for 70th Alvarado to Saranac-Sidewalk, Inclusive.

2. **LOCATION OF WORK:** The location of the Work is as follows:

Montezuma PPL/Mid-City Pipeline Ph 2: See **Appendix E – Location Map**

70th Alvarado to Saranac-Sidewalk: See **Appendix E – Location Map**

3. **CONTRACT TIME:** The Contract Time for completion of the Work, including the 120 Calendar Day Plant Establishment Period, shall be **640 Working Days**.

3.1. The following table is provided to the Contractor as a guide for scheduling purposes. The intent is to set a maximum number of working days for each segment to minimize disruptions for City of San Diego and City of La Mesa’s residents. In the total estimated **640 Working Days**, several segments within the Plans numbered **37333-D** of the project are expected to be constructed concurrently with one another. If the proposed working days in conjunction with the working hours do not fit within the Contractor’s scheduling means, submit a proposed schedule to the Construction Manager for review.

From	To	Segment	Duration (Working Days)
9+20	19+00	Mohawk to 70 th St at Saranac St	75
19+00	29+45	70 th St at Saranac to Manway #2	82
29+45	30+73	Manway #2 to Launch pit	7
30+73	38+10	Micro tunnel	200
38+02	38+22	Receiving pit at Lake Murray Bl (LMB)	100
38+22	38+89	Receiving pit to Manway #3	20
38+89	45+13	LMB	63
45+13	45+98	SDCWA Pipe crossing	240
45+98	57+95	LMB to Alvarado WTP valve vault	70
		Helix Water District 8” waterline replacement	15
		City of La Mesa 8” sewer main replacement	15
		Paving, striping, median work, misc.	170

ATTACHMENT B
PHASED FUNDING PROVISIONS

PHASED FUNDING PROVISIONS

1. PRE-AWARD

- 1.1. Within 10 Working Days of the Notice of Intent to Award, the Contractor must contact the Project Manager to discuss fund availability for each phase and shall also submit the following:
 - 1.1.1. Construction Cost Loaded Schedule in accordance with 6-1, "CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK" and 7-3, "PAYMENT."
- 1.2. Contractor's failure to perform any of the following may result cancelling the award of the Contract:
 - 1.2.1. Meeting with the City's Project Manager to discuss the Phased Funding Schedule.
 - 1.2.2. Agreeing to a Phased Funding Schedule within **thirty** days of meeting with the City's Project Manager.

2. POST-AWARD

- 2.1. Do not start any construction activities for the next phase until the Notice to Proceed (NTP) has been issued by the City. The City will issue a separate NTP for each phase.
- 2.2. The City may issue the NTP for a subsequent phase before the completion of the preceding phase.

PHASED FUNDING SCHEDULE AGREEMENT

The particulars left blank below, such as the total number of phases and the amounts assigned to each phase, will be completed with funding specific information from the Pre-Award Schedule and Construction Cost Loaded Schedule submitted to and approved by the City.

BID NUMBER: K-19-1821-DBB-3

CONTRACT OR TASK TITLE: Montezuma PPL/Mid-City Pipeline Ph2 and 70th-Alvarado to Saranac-Sidewalk

CONTRACTOR: James W. Fowler Co.

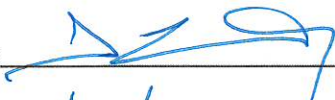
Funding Phase	Phase Description	Phase <u>Start</u>	Phase <u>Finish</u>	Not-to-Exceed Amount
1	Water- Early Work, Begin Shafts, 66" South Sidewalk	NTP	7/31/2020	\$12,000,000.00 \$ 278,625.00
2	Water- 66" South, Tunnels, Restoration	8/1/2020	7/31/2021	\$16,000,000.00
3	Water- 66" North, Restoration	8/1/2021	NOC	\$5,360,752.20
Contract Total				\$33,639,377.20

Notes:

- 1) WHITEBOOK section 7-3.10, "Phased Funding Compensation" applies.
- 2) The total of all funding phases shall be equal to the TOTAL BID PRICE as shown on BID SCHEDULE 1 - PRICES.
- 3) This PHASED FUNDING SCHEDULE AGREEMENT will be incorporated into the CONTRACT and shall only be revised by written modifications to the CONTRACT.

CITY OF SAN DIEGO

PRINT NAME: Steve Lindsay
Construction Manager

Signature: 

Date: 8/22/19

PRINT NAME: Maryam Kargar
Project Manager

Signature: 

Date: 8/22/2019

CONTRACTOR

PRINT NAME: James W. Fowler Co.

Title: Chief Operations Officer

Signature: 

Date: 8/20/19

ATTACHMENT C

RESERVED

ATTACHMENT D
PREVAILING WAGES

PREVAILING WAGES

1. PREVAILING WAGE RATES: Pursuant to San Diego Municipal Code section 22.3019, construction, alteration, demolition, repair and maintenance work performed under this Contract is subject to State prevailing wage laws. For construction work performed under this Contract cumulatively exceeding \$25,000 and for alteration, demolition, repair and maintenance work performed under this Contract cumulatively exceeding \$15,000, the Contractor and its subcontractors shall comply with State prevailing wage laws including, but not limited to, the requirements listed below.

1.1. Compliance with Prevailing Wage Requirements. Pursuant to sections 1720 through 1861 of the California Labor Code, the Contractor and its subcontractors shall ensure that all workers who perform work under this Contract are paid not less than the prevailing rate of per diem wages as determined by the Director of the California Department of Industrial Relations (DIR). This includes work performed during the design and preconstruction phases of construction including, but not limited to, inspection and land surveying work.

1.1.1. Copies of such prevailing rate of per diem wages are on file at the City and are available for inspection to any interested party on request. Copies of the prevailing rate of per diem wages also may be found at <http://www.dir.ca.gov/OPRL/DPreWageDetermination.htm>. Contractor and its subcontractors shall post a copy of the prevailing rate of per diem wages determination at each job site and shall make them available to any interested party upon request.

1.1.2. The wage rates determined by the DIR refer to expiration dates. If the published wage rate does not refer to a predetermined wage rate to be paid after the expiration date, then the published rate of wage shall be in effect for the life of this Contract. If the published wage rate refers to a predetermined wage rate to become effective upon expiration of the published wage rate and the predetermined wage rate is on file with the DIR, such predetermined wage rate shall become effective on the date following the expiration date and shall apply to this Contract in the same manner as if it had been published in said publication. If the predetermined wage rate refers to one or more additional expiration dates with additional predetermined wage rates, which expiration dates occur during the life of this Contract, each successive predetermined wage rate shall apply to this Contract on the date following the expiration date of the previous wage rate. If the last of such predetermined wage rates expires during the life of this Contract, such wage rate shall apply to the balance of the Contract.

- 1.2. Penalties for Violations.** Contractor and its subcontractors shall comply with California Labor Code section 1775 in the event a worker is paid less than the prevailing wage rate for the work or craft in which the worker is employed. This shall be in addition to any other applicable penalties allowed under Labor Code sections 1720 – 1861.
- 1.3. Payroll Records.** Contractor and its subcontractors shall comply with California Labor Code section 1776, which generally requires keeping accurate payroll records, verifying and certifying payroll records, and making them available for inspection. Contractor shall require its subcontractors to also comply with section 1776. Contractor and its subcontractors shall submit weekly certified payroll records online via the City’s web-based Labor Compliance Program. Contractor is responsible for ensuring its subcontractors submit certified payroll records to the City.

 - 1.3.1.** Contractor and their subcontractors shall also furnish records specified in Labor Code section 1776 directly to the Labor Commissioner in the manner required by Labor Code section 1771.4.
- 1.4. Apprentices.** Contractor and its subcontractors shall comply with California Labor Code sections 1777.5, 1777.6 and 1777.7 concerning the employment and wages of apprentices. Contractor is held responsible for the compliance of their subcontractors with sections 1777.5, 1777.6 and 1777.7.
- 1.5. Working Hours.** Contractor and their subcontractors shall comply with California Labor Code sections 1810 through 1815, including but not limited to: (i) restrict working hours on public works contracts to eight hours a day and forty hours a week, unless all hours worked in excess of 8 hours per day are compensated at not less than 1½ times the basic rate of pay; and (ii) specify penalties to be imposed on contractors and subcontractors of \$25 per worker per day for each day the worker works more than 8 hours per day and 40 hours per week in violation of California Labor Code sections 1810 through 1815.
- 1.6. Required Provisions for Subcontracts.** Contractor shall include at a minimum a copy of the following provisions in any contract they enter into with a subcontractor: California Labor Code sections 1771, 1771.1, 1775, 1776, 1777.5, 1810, 1813, 1815, 1860 and 1861.
- 1.7. Labor Code Section 1861 Certification.** Contractor in accordance with California Labor Code section 3700 is required to secure the payment of compensation of its employees and by signing this Contract, Contractor certifies that “I am aware of the provisions of Section 3700 of the California Labor Code which require every employer to be insured against liability for workers’ compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this Contract.”

- 1.8. Labor Compliance Program.** The City has its own Labor Compliance Program authorized in August 2011 by the DIR. The City will withhold contract payments when payroll records are delinquent or deemed inadequate by the City or other governmental entity, or it has been established after an investigation by the City or other governmental entity that underpayment(s) have occurred. For questions or assistance, please contact the City of San Diego's Prevailing Wage Unit at 858-627-3200.
- 1.9. Contractor and Subcontractor Registration Requirements.** This project is subject to compliance monitoring and enforcement by the DIR. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid or proposal, subject to the requirements of section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.
- 1.9.1.** A Contractor's inadvertent error in listing a subcontractor who is not registered pursuant to Labor Code section 1725.5 in response to a solicitation shall not be grounds for filing a bid protest or grounds for considering the bid non-responsive provided that any of the following apply: (1) the subcontractor is registered prior to bid opening; (2) within twenty-four hours after the bid opening, the subcontractor is registered and has paid the penalty registration fee specified in Labor Code section 1725.5; or (3) the subcontractor is replaced by another registered subcontractor pursuant to Public Contract Code section 4107.
- 1.9.2.** By submitting a bid or proposal to the City, Contractor is certifying that he or she has verified that all subcontractors used on this public work project are registered with the DIR in compliance with Labor Code sections 1771.1 and 1725.5, and Contractor shall provide proof of registration for themselves and all listed subcontractors to the City at the time of bid or proposal due date or upon request.
- 1.10. Stop Order.** For Contractor or its subcontractors engaging in the performance of any public work contract without having been registered in violation of Labor Code sections 1725.5 or 1771.1, the Labor Commissioner shall issue and serve a stop order prohibiting the use of the unregistered contractors or unregistered subcontractor(s) on ALL public works until the unregistered contractor or unregistered subcontractor(s) is registered. Failure to observe a stop order is a misdemeanor.

- 1.11. List of all Subcontractors.** The Contractor shall provide the list of subcontractors (regardless of tier), along with their DIR registration numbers, utilized on this Contract prior to any work being performed; and the Contractor shall provide a complete list of all subcontractors with each invoice. Additionally, Contractor shall provide the City with a complete list of all subcontractors (regardless of tier) utilized on this contract within ten working days of the completion of the contract, along with their DIR registration numbers. The City shall withhold final payment to Construction Management Professional until at least thirty (30) days after this information is provided to the City.
- 1.12. Exemptions for Small Projects.** There are limited exemptions for installation, alteration, demolition, or repair work done on projects of \$25,000 or less. The Contractor shall still comply with Labor Code sections 1720 et. seq. The only recognized exemptions are listed below:
- 1.12.1. Registration.** The Contractor will not be required to register with the DIR for small projects. (Labor Code section 1771.1)
- 1.12.2. Certified Payroll Records.** The records required in Labor Code section 1776 shall be required to be kept and submitted to the City of San Diego, but will not be required to be submitted online with the DIR directly. The Contractor will need to keep those records for at least three years following the completion of the Contract. (Labor Code section 1771.4).
- 1.12.3. List of all Subcontractors.** The Contractor shall not be required to hire only registered subcontractors and is exempt from submitting the list of all subcontractors that is required in section 4.20.11 above. (Labor code section 1773.3).

ATTACHMENT E
SUPPLEMENTARY SPECIAL PROVISIONS

SUPPLEMENTARY SPECIAL PROVISIONS

The following Supplementary Special Provisions (SSP) modifies the following documents:

1. The **2018 Edition** of the Standard Specifications for Public Works Construction (The "GREENBOOK").
 2. The **2018 Edition** of the City of San Diego Standard Specifications for Public Works Construction (The "WHITEBOOK"), including the following:
 - a) General Provisions (A) for all Construction Contracts.
-

SECTION 1 – GENERAL, TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 TERMS AND DEFINITIONS. To the "WHITEBOOK", item 54, "Normal Working Hours", ADD the following:

The **Normal Working Hours** are **8:30 AM to 3:30 PM** except for:

- a) Work from Station 30+33 (Denny's Parking Lot) to Station 38+20 is allowed 24 hours a day. Security guard working hours for Denny's parking lot will be 11:30 am to 1:30 pm and 5:00 pm to 7:00 pm Monday through Friday until site has been restored.
- b) Work in City of La Mesa: See Traffic Control Plans
- c) See Traffic Control Plans for alternate times and locations at no additional cost to City.

SECTION 2 - SCOPE OF THE WORK

2-2.2 Caltrans Encroachment Permit. To the "WHITEBOOK", ADD the following:

3. Contractor shall comply with all Caltrans permitting requirement, including, but not limited to tunneling operation, traffic control, and signal operations. Please refer to **Appendix J** for additional requirements.

2-2.3 Payment. To the "WHITEBOOK", item 2, DELETE in its entirety and SUBSTITUTE with the following:

2. The payment for applying and obtaining the Caltrans Encroachment Permit shall be included in the Allowance Bid item for "**Caltrans Encroachment Permit Submittal**" and shall include preparing plans and addressing Caltrans comments.

Add the following:

3. The Contractor will be responsible for paying any fees from the City of La Mesa and Helix Water District. Payment for these fees will be covered under the allowance bid item for "Miscellaneous Agency Fees".

2-3 RIGHT-OF-WAY. To the “WHITEBOOK”, ADD the following:

2. Gas supply trucks shall have access to Shell gas station at the corner of Wisconsin Avenue and Lake Murray Bloulevard at all times.

SECTION 3 – CONTROL OF THE WORK

3-2 SELF-PERFORMANCE. To the “GREENBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

1. You shall perform, with your own organization, Contract Work amounting to at least 50% of the base Bid **AND** 50% of any alternates.

3-8.2 Working Drawings. To the “WHITEBOOK”, TABLE 3-8.2, ADD the following:

Item	Section No.	Title	Subject
18	209-2.2.2 and 306-8.1	Fabricated Steel Pipe, specials, joints and appurtenances	Steel Pipe
19	13300	Instrumentation and Controls	Submittals
20	13370	Control Panels	Submittals

3-8.3 Shop Drawings. To the “GREENBOOK”, TABLE 3-8.3, ADD the following:

Item	Section No.	Title	Subject
5	02160	Pit Shaft Excavation and Support	Submittals
6	02341	Permeation Grouting	Submittals
7	02441	Contact Grouting	Submittals
8	02443	Microtunneling	Submittals
9	02445	Installation of Carrier Pipe in Steel Casing	Submittals
10	02496	Geotechnical Instrumentation	Submittals
11	13300	Instrumentation and Controls	Submittals
12	13374	Control Panel Instrumentation	Submittals
13	13414	Insertion Magnetic Flowmeter	Submittals
14	15102	Triple Offset Metal Seated BFV	Submittals

Item	Section No.	Title	Subject
15	16010	Basic Electrical Requirements	Submittals
16	16120	Wires and Cables	Submittals
17	16190	Supporting Devices	Submittals
18	16195	Electrical Identification	Submittals
19	16450	Grounding	Submittals
20	16640	Cathodic Protection	Submittals

- 3-8.4 Supporting Information.** To the “WHITEBOOK”, ADD the following:
4. Steel pipe submittals per Section 209-2.2.2 and 306-8.1.
 5. Provide supporting information as required by items listed in 3-8.3.
 6. For landscaping and irrigation materials, submit samples and test results to the Engineer within 15 Days of the NTP.
- 3-8.7 Contractor’s Quality Control Plan (QCP).** To the “WHITEBOOK”, ADD the following:
7. The establishment and implementation of a Quality Control Plan (QCP), as defined in the standard specifications, shall be required for this Contract.
- 3-9 TECHNICAL STUDIES AND SUBSURFACE DATA.** To the “WHITEBOOK”, ADD the following:
5. In preparation of the Contract Documents, the designer has relied upon the following reports of explorations and tests at the Work Site:
 - a) Mid-City Pipeline Geotechnical Investigation Report SGC. 18Jun2015.
 - b) Monitoring Well Installation & Groundwater Sampling.
 - c) Pothole Report – X140197 (Final).
 6. The reports listed above are available for review at the following link:
<https://filecloud.sandiego.gov/url/midcitypplphase2>
- 3-10 SURVEYING.** To the “GREENBOOK”, DELETE in its entirety and SUBSTITUTE with the following:
- 3-10 SURVEYING.**
1. You shall locate and mark all features related to the building and site, including landscaping and hardscape, using industry standard contractor’s construction tools.
 2. You shall preserve construction survey stakes, control points, and other survey related marks described in 3-10.1, “Survey Services Provided by the City” for the duration of the Project. If any construction survey stakes are lost or

disturbed and need to be replaced, such replacement shall be performed by the City at your expense.

3-10.1 Survey Services Provided by the City.

1. The City will provide surveying services and on-site survey staking for the following:
 - a) Locations of any property lines, boundaries, or easement surveys within the project boundaries as required by the project.
 - b) Locations of up to four corners per building.
 - c) Verification of building pad finish surface elevation.
 - d) A maximum of 4 site control points.
 - e) Location and perpetuation of survey monuments within the project boundary in accordance with 400-2, "Permanent Survey Markers".
2. Notify the Resident Engineer in writing at least 2 Working Days prior to requesting survey services provided by the City.

3-10.2 Line and Grade.

1. The Work shall conform to the lines, elevations, and grades shown on the Plans. Three consecutive points set on the same slope shall be used together so that any variation from a straight grade can be detected. Any such variation shall be reported to the Engineer. In the absence of such report, you shall be responsible for any error in the grade of the Work.
2. Grades for underground conduits will be set at the surface of the ground. You shall transfer them to the bottom of the trench.

3-10.3 Payment.

1. The payment for survey services Work shall be included in the Contract Price.

3-12.1 General. To the "WHITEBOOK", ADD the following:

2. You shall provide a PM-10 certified self-loading motorized street sweeper equipped with a functional water spray system for this project.
3. You shall sweep all paved areas within the Work site and all paved haul routes as specified below:
 - a) Every Friday on a weekly basis.
 - b) 1 Working Day prior to each rain event.
 - c) As directed by the Engineer.

If these requirements would require you to sweep on a Holiday or Weekend, then you shall sweep the next available Working Day prior to that Holiday or Weekend.

3-12.7 Drinking Water Discharges Requirements. To the "WHITEBOOK", ADD the following:

1. You shall record the results for each discharge event on the City's Drinking Water Discharge Monitoring form included as **Appendix H - Monthly Drinking Water Discharge Monitoring Form.**

3-12.8.8 Payment. To the "WHITEBOOK", ADD the following:

9. Submit supporting invoices and a Schedule of Values for the Lump Sum Bid item for "Dewatering Hazardous Contaminated Water" in accordance with 7-2.1, "Schedule of Values (SOV)". The SOV shall itemize the Work to show the following:
 - a) All costs associated with handling contaminated groundwater specified in 3-12.8.6, "Dewatering System", and 3-12.8.7, "Hazardous Waste Operations and Emergency Response (HAZWOPER) Certificate".
 - b) All costs associated with equipment used for dewatering hazardous contaminated groundwater, including costs for mobilization and demobilization.
 - c) All rental and operating costs for equipment used for dewatering contaminated groundwater.

3-13.3 Warranty. To the "WHITEBOOK", item 1, DELETE in its entirety and SUBSTITUTE with the following:

1. You shall warranty and repair all defective materials and workmanship for a period of 1 year. This call back warranty period shall start on the date the Work was accepted by the City unless the City had beneficial use of the project (excluding water, sewer, and storm drain projects). In addition, you shall warranty the Work against all latent defects for a period of 10 years and patent defects for a period of 4 years.

SECTION 4 - CONTROL OF MATERIALS

4-3.4 Specialty Inspection Paid for by the Contractor. To the "WHITEBOOK", ADD the following:

2. The specialty inspections required are listed as follows:
 - a) Welding of Pipelines (Welding Inspectors).
 - b) 3rd Party Inspection of Manufacture of Valves 48" and larger.
 - c) 3rd Party Inspection of Manufacture of Steel Pipe.

4-3.6 Preapproved Materials. To the "WHITEBOOK", ADD the following:

3. You shall submit in writing a list of all products to be incorporated in the Work that are on the AML.

4-6 TRADE NAMES. To the “WHITEBOOK”, ADD the following:

11. You shall submit your list of proposed substitutions for an “equal” item **no later than 5 Working Days after the determination of the Apparent Low Bidder** and on the City’s Product Submittal Form available at:

<http://www.sandiego.gov/publicworks/edocref/index.shtml>

SECTION 5 – LEGAL RELATIONS AND RESPONSIBILITIES

5-4 INSURANCE. To the “GREENBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

5-4 INSURANCE.

1. The insurance provisions herein shall not be construed to limit your indemnity obligations contained in the Contract.

5-4.1 Policies and Procedures.

1. You shall procure the insurance described below, at its sole cost and expense, to provide coverage against claims for loss including injuries to persons or damage to property, which may arise out of or in connection with the performance of the Work by you, your agents, representatives, officers, employees or Subcontractors.
2. Insurance coverage for property damage resulting from your operations is on a replacement cost valuation. The market value will not be accepted.
3. You shall maintain this insurance for the duration of this Contract and at all times thereafter when you are correcting, removing, or replacing Work in accordance with this Contract. Your liabilities under the Contract, e.g., your indemnity obligations, is not deemed limited to the insurance coverage required by this Contract.
4. The payment for insurance shall be included in the Contract Price as bid by you. Except as specifically agreed to by the City in writing, you are not entitled to any additional payment. Do not begin any Work under this Contract until you have provided and the City has approved all required insurance.
5. Policies of insurance shall provide that the City is entitled to 30 Days (10 Days for cancellation due to non-payment of premium) prior written notice of cancellation or non-renewal of the policy. Maintenance of specified insurance coverage is a material element of the Contract. Your failure to maintain or renew coverage or to provide evidence of renewal during the term of the Contract may be treated by the City as a material breach of the Contract.

5-4.2 Types of Insurance.

5-4.2.1 Commercial General Liability Insurance.

1. Commercial General Liability Insurance shall be written on the current version of the ISO Occurrence form CG 00 01 07 98 or an equivalent form providing coverage at least as broad.

2. The policy shall cover liability arising from premises and operations, XCU (explosions, underground, and collapse), independent contractors, products/completed operations, personal injury and advertising injury, bodily injury, property damage, and liability assumed under an insured's contract (including the tort liability of another assumed in a business contract).
3. There shall be no endorsement or modification limiting the scope of coverage for either "insured vs. insured" claims or contractual liability. You shall maintain the same or equivalent insurance for at least 10 years following completion of the Work.
4. All costs of defense shall be outside the policy limits. Policy coverage shall be in liability limits of not less than the following:

<u>General Annual Aggregate Limit</u>	<u>Limits of Liability</u>
Other than Products/Completed Operations	\$2,000,000
Products/Completed Operations Aggregate Limit	\$2,000,000
Personal Injury Limit	\$1,000,000
Each Occurrence	\$1,000,000

5-4.2.2 Commercial Automobile Liability Insurance.

1. You shall provide a policy or policies of Commercial Automobile Liability Insurance written on the current version of the ISO form CA 00 01 12 90 or later version or equivalent form providing coverage at least as broad in the amount of \$1,000,000 combined single limit per accident, covering bodily injury and property damage for owned, non-owned, and hired automobiles ("Any Auto").
2. All costs of defense shall be outside the limits of the policy.

5-4.2.3 Contractors Pollution Liability Insurance.

1. You shall procure and maintain at your expense or require your Subcontractor, as described below, to procure and maintain the Contractors Pollution Liability Insurance including contractual liability coverage to cover liability arising out of cleanup, removal, storage, or handling of hazardous or toxic chemicals, materials, substances, or any other pollutants by you or any Subcontractor in an amount not less than \$2,000,000 limit for bodily injury and property damage.
2. All costs of defense shall be outside the limits of the policy. Any such insurance provided by your Subcontractor instead of you shall be approved separately in writing by the City.
3. For approval of a substitution of your Subcontractor's insurance, you shall certify that all activities for which the Contractors Pollution Liability Insurance will provide coverage will be performed exclusively by the Subcontractor providing the insurance. The deductible shall not exceed \$25,000 per claim.
4. Contractual liability shall include coverage of tort liability of another party to pay for bodily injury or property damage to a third person or organization.

There shall be no endorsement or modification of the coverage limiting the scope of coverage for either “insured vs. insured” claims or contractual liability.

5. Occurrence based policies shall be procured before the Work commences and shall be maintained for the Contract Time. Claims Made policies shall be procured before the Work commences, shall be maintained for the Contract Time, and shall include a 12 month extended Claims Discovery Period applicable to this contract or the existing policy or policies that shall continue to be maintained for 12 months after the completion of the Work without advancing the retroactive date.
6. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 Days prior written notice (10 Days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

5-4.2.4 Contractors Hazardous Transporters Pollution Liability Insurance.

1. You shall provide at your expense or require your Subcontractor to provide, as described below, Contractors Hazardous Transporters Pollution Liability Insurance including contractual liability coverage to cover liability arising out of transportation of hazardous or toxic, materials, substances, or any other pollutants by you or any Subcontractor in an amount not less than \$2,000,000 limit per occurrence/aggregate for bodily injury and property damage.
2. All costs of defense shall be outside the limits of the policy. The deductible shall not exceed \$25,000 per claim. Any such insurance provided by a subcontractor instead of you shall be approved separately in writing by the City.
3. For approval of the substitution of Subcontractor’s insurance the Contractor shall certify that all activities for which Contractors Hazardous Transporters Pollution Liability Insurance will provide coverage will be performed exclusively by the Subcontractor providing the insurance.
4. Contractual liability shall include coverage of tort liability of another party to pay for bodily injury or property damage to a third person or organization. There shall be no endorsement or modification of the coverage limiting the scope of coverage for either “insured vs. insured” claims or contractual liability. Occurrence based policies shall be procured before the Work commences and shall be maintained for the duration of this Contract. Claims Made policies shall be procured before the Work commences, shall be maintained for the duration of this contract, and shall include a 12 month extended Claims Discovery Period applicable to this contract or the existing policy or policies that shall continue to be maintained for 12 months after the completion of the Work under this Contract without advancing the retroactive date.
5. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 Days prior written notice (10 Days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

5-4.2.5

Contractors Builders Risk Property Insurance.

1. You shall provide at your expense, and maintain until Final Acceptance of the Work, a Special Form Builders Risk Policy or Policies. This insurance shall be in an amount equal to the replacement cost of the completed Work (without deduction for depreciation) including the cost of excavations, grading, and filling. The policy or policies limits shall be 100% of this Contract value of the Work plus 15% to cover administrative costs, design costs, and the costs of inspections and construction management.
2. Insured property shall include material or portions of the Work located away from the Site but intended for use at the Site and shall cover material or portions of the Work in transit. The policy or policies shall include as insured property scaffolding, falsework, and temporary buildings located at the Site. The policy or policies shall cover the cost of removing debris, including demolition.
3. The policy or policies shall provide that all proceeds thereunder shall be payable to the City as Trustee for the insured, and shall name the City, the Contractor, Subcontractors, and Suppliers of all tiers as named insured. The City, as Trustee, will collect, adjust, and receive all monies which may become due and payable under the policy or policies, may compromise any and all claims thereunder, and will apply the proceeds of such insurance to the repair, reconstruction, or replacement of the Work.
4. Any deductible applicable to the insurance shall be identified in the policy or policies documents and responsibility for paying the part of any loss not covered because of the application of such deductibles shall be apportioned among the parties except for the City as follows: if there is more than one claimant for a single occurrence, then each claimant shall pay a pro-rata share of the per occurrence deductible based upon the percentage of their paid claim to the total paid for insured. The City shall be entitled to 100% of its loss. You shall pay the City any portion of that loss not covered because of a deductible at the same time the proceeds of the insurance are paid to the City as trustee.
5. Any insured, other than the City, making claim to which a deductible applies shall be responsible for 100% of the loss not insured because of the deductible. Except as provided for under California law, the policy or policies shall provide that the City is entitled to 30 Days prior written notice (10 Days for cancellation due to non-payment of premium) of cancellation or non-renewal of the policy or policies.

5-4.2.6

Railroad Protective Liability Insurance. Exclusions relating to performance of operations within the vicinity of any railroad, bridge, trestle, roadbed, tunnel, underpass, or cross shall be deleted from all policies to which they may apply. Alternatively, you may provide separate Railroad Protective Liability insurance providing coverage, including endorsements, equivalent to that required for the CGL described herein.

5-4.3 Rating Requirements. Except for the State Compensation Insurance Fund, all insurance required by this Contract as described herein shall be carried only by responsible insurance companies with a rating of, or equivalent to, at least "A-, VI" by A.M. Best Company, that are authorized by the California Insurance Commissioner to do business in the State, and that have been approved by the City.

5-4.3.1 Non-Admitted Carriers. The City will accept insurance provided by non-admitted, "surplus lines" carriers only if the carrier is authorized to do business in the State and is included on the List of Approved Surplus Lines Insurers (LASLI list).

All policies of insurance carried by non-admitted carriers shall be subject to all of the requirements for policies of insurance provided by admitted carriers described herein.

5-4.4 Evidence of Insurance. Furnish to the City documents e.g., certificates of insurance and endorsements evidencing the insurance required herein, and furnish renewal documentation prior to expiration of this insurance. Each required document shall be signed by the insurer or a person authorized by the insurer to bind coverage on its behalf. We reserve the right to require complete, certified copies of all insurance policies required herein.

5-4.5 Policy Endorsements.

5-4.5.1 Commercial General Liability Insurance.

5-4.5.1.1 Additional Insured.

1. You shall provide at your expense policy endorsement written on the current version of the ISO Occurrence form CG 20 10 11 85 or an equivalent form providing coverage at least as broad.
2. To the fullest extent allowed by law e.g., California Insurance Code §11580.04, the policy shall be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured.
3. The additional insured coverage for projects for which the Engineer's Estimate is \$1,000,000 or more shall include liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products,
 - c) your Work, e.g., your completed operations performed by you or on your behalf, or
 - d) premises owned, leased, controlled, or used by you.
4. The additional insured coverage for projects for which the Engineer's Estimate is less than \$1,000,000 shall include liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products, or
 - c) premises owned, leased, controlled, or used by you.

5-4.5.1.2 Primary and Non-Contributory Coverage. The policy shall be endorsed to provide that the coverage with respect to operations, including the completed operations, if appropriate, of the Named Insured is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives. Further, it shall provide that any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of your insurance and shall not contribute to it.

5-4.5.1.3 Project General Aggregate Limit. The policy or policies shall be endorsed to provide a Designated Construction Project General Aggregate Limit that will apply only to the Work. Only claims payments which arise from the Work shall reduce the Designated Construction Project General Aggregate Limit. The Designated Construction Project General Aggregate Limit shall be in addition to the aggregate limit provided for the products-completed operations hazard.

5-4.5.2 Commercial Automobile Liability Insurance.

5-4.5.2.1 Additional Insured. Unless the policy or policies of Commercial Auto Liability Insurance are written on an ISO form CA 00 01 12 90 or a later version of this form or equivalent form providing coverage at least as broad, the policy shall be endorsed to include the City and its respective elected officials, officers, employees, agents, and representatives as additional insured, with respect to liability arising out of automobiles owned, leased, hired or borrowed by you or on your behalf. This endorsement is limited to the obligations permitted by California Insurance Code §11580.04.

5-4.5.3 Contractors Pollution Liability Insurance Endorsements.

5-4.5.3.1 Additional Insured.

1. The policy or policies shall be endorsed to include as an Insured the City and its respective elected officials, officers, employees, agents, and representatives, with respect to liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products,
 - c) your work, e.g., your completed operations performed by you or on your behalf, or
 - d) premises owned, leased, controlled, or used by you.

Except that in connection with, collateral to, or affecting any construction contract to which the provisions of subdivision (b) of § 2782 of the California Civil Code apply, this endorsement shall not provide any duty of indemnity coverage for the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives in any case where an agreement to indemnify the City and its respective elected officials, officers, employees, agents, and representatives would be invalid under subdivision (b) of §2782 of the California Civil Code.

2. In any case where a claim or loss encompasses the negligence of the Insured and the active negligence of the City and its respective elected officials,

officers, employees, agents, and representatives that are not covered because of California Insurance Code §11580.04, the insurer's obligation to the City and its respective elected officials, officers, employees, agents, and representatives shall be limited to obligations permitted by California Insurance Code §11580.04.

5-4.5.3.2 Primary and Non-Contributory Coverage. The policy or policies shall be endorsed to provide that the insurance afforded by the Contractors Pollution Liability Insurance policy or policies is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives with respect to operations including the completed operations of the Named Insured. Any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of your insurance and shall not contribute to it.

5-4.5.3.3 Severability of Interest. For Contractors Pollution Liability Insurance, the policy or policies shall provide that your insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability and shall provide cross-liability coverage.

5-4.5.4 Contractors Hazardous Transporters Pollution Liability Insurance Endorsements.

5-4.5.4.1 Additional Insured.

1. The policy or policies shall be endorsed to include as an Insured the City and its respective elected officials, officers, employees, agents, and representatives, with respect to liability arising out of:
 - a) Ongoing operations performed by you or on your behalf,
 - b) your products,
 - c) your work, e.g., your completed operations performed by you or on your behalf, or
 - d) premises owned, leased, controlled, or used by you.

Except that in connection with, collateral to, or affecting any construction contract to which the provisions of subdivision (b) of §2782 of the California Civil Code apply, this endorsement shall not provide any duty of indemnity coverage for the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives in any case where an agreement to indemnify the City and its respective elected officials, officers, employees, agents, and representatives would be invalid under subdivision (b) of §2782 of the California Civil Code.

2. In any case where a claim or loss encompasses the negligence of the Insured and the active negligence of the City and its respective elected officials, officers, employees, agents, and representatives that are not covered because of California Insurance Code §11580.04, the insurer's obligation to the City and its respective elected officials, officers, employees, agents, and representatives shall be limited to obligations permitted by California Insurance Code §11580.04.

- 5-4.5.4.2 Primary and Non-Contributory Coverage.** The policy or policies shall be endorsed to provide that the insurance afforded by the Contractors Pollution Liability Insurance policy or policies is primary to any insurance or self-insurance of the City and its elected officials, officers, employees, agents and representatives with respect to operations including the completed operations of the Named Insured. Any insurance maintained by the City and its elected officials, officers, employees, agents and representatives shall be in excess of your insurance and shall not contribute to it.
- 5-4.5.4.3 Severability of Interest.** For Contractors Hazardous Transporters Pollution Liability Insurance, the policy or policies shall provide that your insurance shall apply separately to each insured against whom claim is made or suit is brought, except with respect to the limits of the insurer's liability and shall provide cross-liability coverage.
- 5-4.5.5 Builders Risk Endorsements.**
- 5-4.5.5.1 Waiver of Subrogation.** The policy or policies shall be endorsed to provide that the insurer will waive all rights of subrogation against the City, and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from Work performed by the Named Insured for the City.
- 5-4.5.5.2 Builders Risk – Partial Utilization.** If the City desires to occupy or use a portion or portions of the Work prior to Acceptance in accordance with this Contract, the City will notify you and you shall immediately notify your Builder's Risk insurer and obtain an endorsement that the policy or policies shall not be cancelled or lapse on account of any such partial use or occupancy. You shall obtain the endorsement prior to the City's occupation and use.
- 5-4.6 Deductibles and Self-Insured Retentions.** You shall pay for all deductibles and self-insured retentions. You shall disclose deductibles and self-insured retentions to the City at the time the evidence of insurance is provided.
- 5-4.7 Reservation of Rights.** The City reserves the right, from time to time, to review your insurance coverage, limits, deductibles and self-insured retentions to determine if they are acceptable to the City. The City will reimburse you, without overhead, profit, or any other markup, for the cost of additional premium for any coverage requested by the Engineer but not required by this Contract.
- 5-4.8 Notice of Changes to Insurance.** You shall notify the City 30 Days prior to any material change to the policies of insurance provided under this Contract.
- 5-4.9 Excess Insurance.** Policies providing excess coverage shall follow the form of the primary policy or policies e.g., all endorsements.
- 5-4.10 Architects and Engineers Professional Insurance (Errors and Omissions Insurance).**
1. For Contracts with required engineering services (e.g., Design-Build, preparation of engineered Traffic Control Plans (TCP), and etc) by you, you shall keep or require all of your employees or Subcontractors, who provide professional engineering services under this contract, Professional Liability coverage with a limit of **\$1,000,000** per claim and **\$2,000,000** annual aggregate in full force and effect.

2. You shall ensure the following:
 - a) The policy retroactive date is on or before the date of commencement of the Project.
 - b) The policy will be maintained in force for a period of 3 years after completion of the Project or termination of this Contract, whichever occurs last. You agree that for the time period specified above, there will be no changes or endorsements to the policy that affect the specified coverage.
3. If professional engineering services are to be provided solely by the Subcontractor, you shall:
 - a) Certify this to the City in writing and
 - b) Agree in writing to require the Subcontractor to procure Professional Liability coverage in accordance with the requirements set forth above.

5-4.11 Workers' Compensation Insurance and Employers Liability Insurance.

1. In accordance with the provisions of §3700 of the California Labor Code, you shall provide at your expense Workers' Compensation Insurance and Employers Liability Insurance to protect you against all claims under applicable state workers compensation laws. The City, its elected officials, and employees will not be responsible for any claims in law or equity occasioned by your failure to comply with the requirements of this section.
2. Limits for this insurance shall be not less than the following:

<u>Workers' Compensation</u>	<u>Statutory Employers Liability</u>
Bodily Injury by Accident	\$1,000,000 each accident
Bodily Injury by Disease	\$1,000,000 each employee
Bodily Injury by Disease	\$1,000,000 policy limit
4. By signing and returning the Contract you certify that you are aware of the provisions of §3700 of the Labor Code which requires every employer to be insured against liability for worker's compensation or to undertake self-insurance in accordance with the provisions of that code and you shall comply with such provisions before commencing the Work as required by §1861 of the California Labor Code.

5-4.11.1. Waiver of Subrogation. The policy or policies shall be endorsed to provide that the insurer will waive all rights of subrogation against the City and its respective elected officials, officers, employees, agents, and representatives for losses paid under the terms of the policy or policies and which arise from Work performed by the Named Insured for the City.

ADD:

5-10.1.3 Weekly Updates Recipients.

1. Submit a weekly correspondence with updates, traffic control issues and locations, lane closures, and any other pertinent information (with additional contact names given during award process) to the following recipients:

Montezuma PPL/Mid-City Pipeline Ph 2

Brian Vitelle, Senior Engineer, BVitelle@sandiego.gov

Maryam Kargar, Project Engineer, MKargar@sandiego.gov

Resident Engineer, TBA, XXX@sandiego.gov

70th-Alvarado to Saranac-Sidewalk

Daniel Nutter, Senior Engineer, DNutter@sandiego.gov

Hong Le, Project Manager, LeH@sandiego.gov

Resident Engineer, TBA, XXX@sandiego.gov

5-10.3 Exclusive Community Liaison Services. To the "WHITEBOOK", ADD the following:

2. You shall retain an Exclusive Community Liaison for the Project that shall implement Work in accordance with the specifications described in 5-10.2 "Community Outreach Services" and 5-10.3 "Exclusive Community Liaison Services".

5-13 ELECTRONIC COMMUNICATION. To the "WHITEBOOK", ADD the following:

2. Virtual Project Manager shall be used on this Contract. For more information, refer to the VPM training videos at the location below:

<https://www.sandiego.gov/publicworks/edocref>

SECTION 6 – PROSECUTION AND PROGRESS OF THE WORK

6-1.1 Construction Schedule. To the "WHITEBOOK", item 1, subsection "s", DELETE in its entirety and SUBSTITUTE with the following:

- s) Submit an updated cash flow forecast with every pay request (for each Project ID or WBS number provided in the Contract) showing periodic and cumulative construction billing amounts for the duration of the Contract Time. If there has been any Extra Work since the last update, include only the approved amounts.
 - i. Refer to the Sample City Invoice materials in **Appendix D – Sample City Invoice with Cash Flow Forecast** and use the format shown.
 - ii. See also the "Cashflow Forecast Example" at the location below:

<https://www.sandiego.gov/publicworks/edocref>

To the "WHITEBOOK", ADD the following:

3. The **120 Calendar Day** Plant Establishment Period is included in the stipulated Contract Time and shall begin with the acceptance of installation of the vegetation plan in accordance with Section 801-6, "MAINTENANCE AND PLANT ESTABLISHMENT".

6-1.5.2 Excusable Non-Compensable Delays. To the "WHITEBOOK", DELETE in its entirety.

ADD:

6-1.5.2 Excusable Non-Compensable and Concurrent Delays.

1. The City shall only issue an extension of time for Excusable Delays that meet the requirements of 6-4.2, "Extensions of Time" for the following circumstances:
 - a) Delays resulting from Force Majeure.
 - b) Delays caused by weather.
 - c) Delays caused by changes to County, State, or Federal law.
2. When a non-excusable delay is concurrent with an Excusable Delay, you shall not be entitled to an extension of Contract Time for the period the non-excusable delay is concurrent with the Excusable Delay.
3. When an Excusable Non-Compensable Delay is concurrent with an Excusable Compensable Delay, you shall be entitled to an extension of Contract Time, but shall not be entitled to compensation for the period the Excusable Non-Compensable Delay is concurrent with the Excusable Compensable Delay.

6-4.2 Extensions of Time. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. The Contract Time shall not be modified except by Change Order.
2. You shall notify the City in writing within **1 Working Day** after the occurrence and discovery of an event that impacts the Project Schedule.
 - a) If you believe this event requires a Change Order, you shall submit a **written Change Order request with a report to** the City that explains the request for Change Order within **5 Working Days**. The Change Order request must include supporting data, a general description of the discovery, the basis for extension, and the estimated length of extension. The City may grant an extension of time, in writing, for the Change Order request if you require more time to gather and analyze data.
3. The Engineer shall not grant an extension of Contract Time in accordance with 6-1.5, "Excusable Delays" unless you demonstrate, through an analysis of the critical path, the following:
 - a) The event causing the delay impacted the activities along the Project's critical path.

- b) The increases in the time to perform all or part of the Project beyond the Contract Time arose from unforeseeable causes beyond your control and without your fault or negligence and that all project float has been used.
4. Any modifications to the Contract Time will be incorporated into the weekly document that the Engineer issues that stipulates the Contract Time. If you do not agree with this document, submit to the Engineer for review a written protest supporting your objections to the document within **30 Calendar Days** after receipt of the statement. Your failure to file a timely protest shall constitute your acceptance of the Engineer’s weekly document.
- a) Your protest will be considered a claim for time extension and shall be subject to 2-10.1, “Claims”.

ADD:

6-6.1.1 Environmental Document.

- 1. The City of San Diego has prepared a **Final Mitigated Negative Declaration** for **Montezuma Pipeline / Mid-City Pipeline Phase 2**, Project No. **S-11026**, as referenced in the Contract Appendix. You shall comply with all requirements of the **Final Mitigated Negative Declaration** as set forth in **Appendix A**.
- 2. The City of San Diego has prepared a **Notice of Exemption (NOE)** for **70th-Alvarado to Saranac-Sidewalk**, Project No. **B-17065**, as referenced in the Contract Appendix. You shall comply with all requirements of the **Notice of Exemption** as set forth in **Appendix A**.
- 3. Compliance with the City’s environmental document shall be included in the Contract Price.

6-6.2.1 Archaeological and Native American Monitoring Program. To the “WHITEBOOK”, ADD the following:

- 4. You shall retain a qualified archaeologist and Native American Monitor for this Contract. You shall coordinate your activities and Schedule with the activities and schedules of the archaeologist and Native American monitor. Notify the Engineer before noon of the Working Day before monitoring is required. See 3-5, “INSPECTION” for details.

6-6.2.2 Paleontological Monitoring Program. To the “WHITEBOOK”, ADD the following:

- 3. You shall retain a qualified paleontologist for this Contract. You shall coordinate your activities and Schedule with the activities and schedules of the paleontologist monitor. Notify the Engineer before noon of the Working Day before monitoring is required. See 3-5, “INSPECTION” for details.

6-6.4 Written Notice and Report. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

- 1. Your failure to notify the Resident Engineer within **1 Working Day** OR provide a Change Order request within **5 Working Days** after the event, in accordance with 6-4.2, “Extensions of Time”, will be considered grounds for refusal by the

City to consider such request if your failure to notify prejudices the City in responding to the event.

SECTION 7 – MEASUREMENT AND PAYMENT

7-3.1 General. To the “WHITEBOOK”, ADD the following:

3. The Bid item for “**Denny’s Security Guard**” shall include, but shall not be limited to, the Work as specified in the Plans, Contract Documents, and Technicals Section 02443.
4. The Lump Sum Bid item for “**New City of La Mesa Gateway Sign**” in Alternate A shall include, and not be limited to, the construction of the new City of La Mesa Gateway Sign and associated lighting, as specified in the Plans and Contract Documents.
5. If a Bid item has not been provided for an item of the Work described or shown in the Contract Documents, the payment shall be include in the Contract Price.

7-3.2 Partial and Final Payment. To the “GREENBOOK”, paragraph (3), DELETE in its entirety and SUBSTITUTE with the following:

Upon commencement of the Work, an escrow account shall be established in a financial institution chosen by you and approved by the City. Documentation for an escrow payment shall have an escrow agreement signed by you, the City, and the escrow agent. From each progress payment, no less than 5% will be deducted and deposited by the City into the escrow account. Upon completion of the Contract, the City will notify the Escrow agent in writing to release the funds to you. Only the designated representative of the City shall sign the request for the release of Escrow funds.

7-3.11 Compensation Adjustments for Price Index Fluctuations. To the “WHITEBOOK” ADD the following:

5. This Contract is not subject to the provisions of The “WHITEBOOK” for Compensation Adjustments for Price Index Fluctuations for paving asphalt.

SECTION 201 – CONCRETE, MORTAR AND RELATED MATERIALS

201-1.1.1 General. To the “GREENBOOK”, ADD the following:

1. When called for on the plans, 2 sack concrete slurry shall be 2,500 psi minimum.

SECTION 209 – PRESSURE PIPE

209-1.1.1 General. To the “WHITEBOOK”, ADD the following:

2. PVC products, specifically type C900 and C905, as manufactured or distributed by J-M Manufacturing Company or JM Eagle shall not be used on the Contract for pressurized pipe.
3. Refer to AWWA C900-16 for all references to AWWA C905.

209-1.1.2 Materials. To the "WHITEBOOK", ADD the following:

14. Bolts shall be hot-dipped galvanized tee heads made of high-strength low-alloy or ductile iron in accordance with AWWA C111. ASTM A307 Grade A bolts shall not be used.
15. Fittings shall be as shown on the plans. If fitting/joint type is not noted refer to item 1.

209-2.1 General. To the "GREENBOOK", ADD the following:

Steel pipe and specials used for water transmission mains and casings shall be fabricated steel pipe conforming to the latest edition of AWWA C200. Pipe shall be as follows:

Pipe & Fitting Diameter	Pipe & Fitting Thickness	Cement Lining Thickness	Cement Mortar Coating Thickness	Joint Type (unless noted otherwise on the plans)
66"	1/2"	3/4"	1-1/4 "	Single welded lap joint on interior
82" min. (Casing, tunneling) ¹	1" min.	NA	NA	Locking push on type, T5, Permalok or approved equal

¹ Inside diameter of the steel casing pipe is assumed to be 82-inch but shall be finalized by the Contractor so as to provide the minimum clearance required all around the outside diameter of the final carrier pipe and fiber optic conduit(s), and to account for any installation misalignment during casing pipe advancement. The CONTRACTOR may select a greater pipe diameter or thickness for the method of work, loading characteristics, site conditions, or possible interferences; and shall be fully responsible for the sufficiency of the casing provided.

209-2.2.1 Materials. To the "GREENBOOK", Table 209-2.2.1, Pipe, Material, ADD the following:

Steel used in fabricated steel pipe shall comply with the physical and chemical requirements of ASTM A139, Grade C or ASTM 1018 modified to grade 42. Casing pipe shall be at a minimum ASTM A36 steel.

ADD:

209-2.2.1.1 Cement Mortar Lining and Polyolefin Tape Coating.

1. Steel pipe, fittings and specials shall be lined and coated as follows:
 - a) Cement mortar lining shall comply with the requirements of Table 209-2.2.1. Lining shall be trimmed as necessary to allow full operation of butterfly valves at connections to steel pipe. After trimming, any exposed portions of pipe interior shall be lined with liquid epoxy per AWWA C210.
 - b) External surfaces of steel pipe and specials shall be coated with a 3 part factory applied tape coating system in accordance with AWWA

C214 for steel pipe and AWWA C209 for steel pipe specials, connections and fittings. Additional mechanical protection shall be provided by the application of a reinforced cement mortar armor coating applied in accordance with AWWA C205. Cement shall be ASTM C150, Type II/V and admixtures shall contain no chlorides. Lining shall be trimmed as necessary to allow full operation of butterfly valves at connections to steel pipe. Line exposed portions of pipe interior with liquid epoxy per AWWA C210.

- c) All steel pipe joint exteriors shall have an 80 mil heat shrink polyolefin sleeve or field applied 3 layer tape installed after welding conforming to the requirements of AWWA C216 and approved by Engineer. Use Canusa or approved equal.
- d) Circumferential steel fabric reinforcement shall be 12-gauge wire minimum per ASTM A185 or ASTM A497.
- e) Allow linings and coating to cure at least 7 days at not less than 40 degrees prior to shipping to the site.
- f) Hold back lining and coating from socket and spigot ends per Manufacturer's standard practices. Hold back coating from ends of butt-strap, mechanical coupling, and flanged joint pipe sufficient distance to permit field assembly of joints. Lining shall terminate at pipe ends, except where otherwise specified or where necessary to accommodate free motion of butterfly valve discs.
- g) Cement-mortar lining and coating of pipe joints in field shall conform to AWWA C205 Section 4.7 and AWWA C602 Section 4-8.

209-2.2.2 Submittals. To "GREENBOOK", ADD the following:

SUBMITTAL	DESCRIPTION	
Shop Drawings	<p>Submit per piping shop drawing requirements.</p> <p>Include legible plan and profile diagram of pipe lay diagram , layout schedule, fabrication details and dimensional checks</p> <p>Layout schedule shall show order of installation, length and location of each pipe section and special, station and elevation of pipe invert at all changes in grade, and all data on curves and bends for both horizontal and vertical alignment.</p> <p>Do not manufacture pipe until shop drawings are approved.</p>	.

SUBMITTAL	DESCRIPTION	
Catalog Data	Required for pipe, protective coating and welding rod for field welding.	
Installation Instructions	Required per installation instruction requirements.	
Certificate of Compliance	Submit coating system and application certification per certificate of compliance requirements.	
	Manufacturer certifications.	
Test Record Transcripts	Submit mill reports and plant test reports per test record transcript requirements.	
	Submit mill report showing type of steel and physical and chemical properties for each heat number of steel used in fabricating pipe.	
	Submit test reports showing physical properties of rubber used in gaskets	
Welder Qualification Certificates	Required per standard qualification procedure of ASME Boiler and Pressure Vessel Code Section IX, Welding Qualifications	

209-2.2.4 Joints. To the "GREENBOOK", ADD the following:

1. Unless noted otherwise on the plans, joint type for steel pipe and fittings shall be as shown in the Table in Section 209-2.1.
2. Flanges shall be Class D per AWWA C207 with a maximum working pressure of 150psi. All nuts, bolts and washers shall be class 316 stainless steel.
3. Sleeve couplings with restraint harness shall be steel and of a gasketed, sleeve type design with diameter to properly fit the pipe. Each coupling shall consist of one (1) steel middle ring, two (2) steel followers, two (2) rubber-compounded wedge section gaskets and sufficient track-head steel bolts to properly compress the gaskets. All nuts, bolts and washers shall be class 316 stainless steel. Restraint harness shall be per AWWA M11 design. Coupling shall conform to AWWA C200 Section 4.13. It shall be square cut or beveled with no burrs. Outside surfaces where coupling seats, shall be free of indentations, projections, or roll marks to ensure watertight seal. Pipe ends shall have tolerances within limits required by mechanical coupling Manufacturer.

209-2.2.5 Special Sections. To the "GREENBOOK", ADD the following:

1. Special pipe and fittings shall be furnished as follows:
 - a) Manufacturer shall furnish all fittings and special pieces required for closures, curves, bends, branches, manholes, outlets, connections for mainline valves, and other appurtenances required.
 - b) Fabricate special fittings of welded steel sheet or plate, lined and coated with cement-mortar of same type as adjoining pipe and applied as specified for lining and coating of specials in AWWA C205 and as modified herein. Butt welding shall be used, unless otherwise indicated.
 - c) Minimum centerline radius of elbow or bend shall be as follows. Maximum deflection at a mitered girth seam shall be $22\frac{1}{2}^{\circ}$.
 - d) Reinforce outlets at special fittings with collars, wrapper plates or crotch plates. If collar or wrapper reinforcement is used, outlet diameter shall not exceed 69% of fitting ID. Diameter of outlets reinforced with crotch plates may equal fitting diameter.

SECTION 212 - WATER AND SEWER SYSTEM VALVES AND APPURTENANCES

212-5.2 Butterfly Valves. To the "WHITEBOOK", ADD the following:

1. Butterfly valves shall be metal seated triple offset valves per Specification Section 15102.

212-5.6 Air Release, Air/Vacuum and Combination Air Valves. To the "GREENBOOK, ADD the following:

Combination Air Valves (AV/AR): Combination air valves shall combine the characteristics of air/vacuum valves and air release valves by exhausting accumulated air in systems under pressure and releasing or re-admitting large quantities of air, while a system is being filled or drained, respectively. They shall be of the sizes indicated on the Drawings, with flanged or threaded ends to match adjacent piping. Bodies shall be of high-strength cast iron per ASTM A126, Class B. The float, washers, nuts bolts and all moving parts shall be constructed of Type 316 stainless steel. Seat shall be BUNA N. Air/vacuum valves shall be designed for minimum 250-psi (as applicable) water working pressure, unless otherwise indicated.

Manufacturers shall be APCO, Val-Matic, GA Industries or approved equal..

Air release, air/vacuum, and/or combination air valves shall be installed at high points in piping systems and where indicated on the Drawings.

All valves shall be installed in accordance with the manufacturer's printed recommendations.

Combination air and vacuum valves shall have piped outlets to the nearest acceptable drain, firmly supported, and installed in such a way as to avoid splashing and wetting of floors.

212-10.6.3 Polymer Concrete Water Meter Boxes. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. Boxes and covers shall be in accordance with the Water Approved Materials List or approved equal.
2. Boxes and covers to be installed in all areas shall have a reinforced polymer concrete frame and cover designed for AASHTO H-20 traffic loading.
3. Covers shall have a logo reading "SD CITY WATER" as well as the manufacturer's name or logo cast in the polymer concrete surface. A cover selected at random shall be tested.
4. Covers shall be solid per SDW-136, sheet 1 only. Reader lids shall not be installed.

SECTION 217 - BEDDING AND BACKFILL MATERIALS

217-1 BEDDING MATERIAL. To the "GREENBOOK", ADD the following:

Bedding material for steel pipe shall be $\frac{3}{4}$ " crushed rock wrapped in filter fabric. Filter fabric shall comply with AASHTO M 288-15, Class 2 and shall be Mirafi 160N or approved equal.

SECTION 300 - EARTH WORK

300-1.4 Payment. To the "WHITEBOOK", paragraphs 5, 6, and 7, DELETE in its entirety and SUBSTITUTE with the following:

5. The demolition, removal, and disposal of various types of existing hardscape in parkway areas, such as colored concrete, bricks, flagstone and fences in the parkway or right-of-way, shall be included in the associated items of Work.
6. Payment for the removal and disposal of tree roots and root pruning shall be included in the Bid item for the Work item that requires removal and disposal of roots and root pruning.

300-2 UNCLASSIFIED EXCAVATION

300-2.1 General. To the GREENBOOK, ADD the following:

Unclassified excavation shall consist of all excavation necessary to remove existing material that is unsuitable to be used as a base or sub base material, as directed by Engineer. Unclassified excavation shall be replaced with Class II Base material and prepared and compacted in accordance with the Contract Documents before placing new asphalt concrete or forming and pouring of concrete at that location.

300-2.2 Unsuitable Material.

300-2.2.1 General. To the GREENBOOK, DELETE this section in its entirety and SUBSTITUTE with the following:

Material that is unsuitable to be used for asphalt concrete Base, cross gutters, alley apron, curb ramps, sidewalk, curb and gutter, driveways, and concrete pavement base shall be excavated and disposed of as directed by the Engineer.

Unless otherwise directed by the Engineer, if the excavation of unsuitable material requires a depth of 2 feet or greater, you shall install pavement fabric in accordance with 302-7 "PAVEMENT FABRIC" before backfilling with Class II Base in accordance with 301-2 "UNTREATED BASE".

300-2.9 **Payment.** To the GREENBOOK, DELETE this section in its entirety and SUBSTITUTE with the following:

Payment for unclassified excavation shall be paid as "Class II Base" in accordance with 301-2.4, "Measurement and Payment". Payment for unclassified excavation shall include, excavating, loading, disposing of material, stockpiling, and hauling to its final location.

Payment for removal and disposal of existing pavement and concrete panel base preparation shall be paid in accordance with 302-6.8, "Measurement and Payment".

Payment for the installation of pavement fabric shall be paid in accordance with 302-7.4, "Payment".

SECTION 302 – ROADWAY SURFACING

302-6.8 **Measurement and Payment.** To the GREENBOOK, ADD the following:

Payment for removing and replacing concrete pavement also includes installation of all concrete joints, saw cut, concrete base preparation, excavation, removal and disposal of existing materials, preparation of subgrade, grading and compaction and shall be included in the bid item for "**Concrete Pavement Replacement (8 Inch thick)**".

For unsuitable materials, see section 301-2, "UNTREATED BASE".

302-7.4 **Payment.** To the the "WHITEBOOK", item 1, last sentence, DELETE in its entirety and SUBSTITUTE with the following:

Payment shall not be made for additional fabric for overlapped areas.

SECTION 303 – CONCRETE AND MASONRY CONSTRUCTION

ADD:

303-1.12 **Payment.** To the "GREENBOOK", Paragraph (1) DELETE in its entirety and SUBSTITUTE with the following:

The payment for Gravity Retaining Wall shall be paid per Square Foot as bid item labeled "**Gravity Retaining Wall**" that is measured parallel to finish grade from top of wall to bottom of footing.

303-5.10.2 **Payment.** To the the "WHITEBOOK", ADD the following:

4. Payment for each curb ramp or modified curb ramp shall also include removal and replacement of all hardscape, landscape and irrigation, curb and gutter, handrails, ramps, drainage structures and pipe and any other items of work as shown on the curb ramp details on the construction plans.

303-6.5 Measurement and Payment. To the the “WHITEBOOK”, ADD the following:

2. The work for bid items “Colored stamped concrete raised median”, “Concrete raised median” and “Asphalt concrete raised median” shall be paid for in the square foot bid items for each. This price shall include the payment for the Work associated with the median curb and gutter.

SECTION 306 – OPEN TRENCH CONDUIT CONSTRUCTION

306-1 General. To the “GREENBOOK”, ADD the following:

It is anticipated the onsite soils will be generally excavatable with conventional, heavy duty trench excavation equipment although areas of very dense to hard well-cemented soils will likely be encountered in the Lindavista Formation and Stadium Conglomerate. These well-cemented soils may require heavy ripping, jackhammering or rock breaking excavation methods.

The City does not represent that anticipated conditions will be encountered in performing the Work per section 3-9 of the “WHITEBOOK” of the specifications.

306-3.7 Imported Backfill. To the “WHITEBOOK”, ADD the following:

Imported backfill shall be granular, have an expansion index less than 20 (per ASTM D4829) and no particles greater than 3” in maximum dimension.

306-4 Shoring and Bracing. To the “WHITEBOOK”, ADD the following:

Shoring is the responsibility of the Contractor and shall be designed by a structural engineer licensed in the State of California. Excavated and/or backfill soils should not be stockpiled at the top of temporary excavations (or trenches) or in close proximity (within the area defined by a 45 degree angle from the bottom of the temporary excavation or trench.)

306-8.3.2 Installation. To the “GREENBOOK”, ADD the following:

Pothole per Section 402 and make field measurements needed before submitting shop drawings or ordering pipe, fittings or specials. Make minor changes in dimensions and alignments as needed to avoid utilities or structural conflicts.

Steel pipe shall be laid so the bell end of pipe faces in direction of laying. Pipe on slopes steeper than 20% shall be laid in uphill direction. Prior to laying pipe, grade trench bottom and prepare to provide uniform bearing throughout entire length of each pipe joint. Excavate suitable bell holes at each joint and scoop out a shallow lateral depression half a pipe length from last pipe laid to allow for easy removal of belt pipe sling and thus avoid any movement of pipe after it is placed on proper line and grade.

The following installation standards shall be followed:

1. Manufacturer’s installation and warranty requirements
2. Applicable OSHA and Cal OSHA regulations
3. Applicable building, fire, plumbing and mechanical code requirements

4. AWWA C604 Installation of Steel Water Pipe 4 in and Larger
5. AWWA M11 Steel Water Pipe: A Guide for Design and Installation

306-8.3.2.2 Welded Joints. To the "GREENBOOK", ADD the following:

Install extruded butyl rubber pipe joint sealant. Apply sealant per Manufacturer's instructions.

ADD:

306-8.3.4 Steel Pipe Field Quality Control

Field testing shall include:

ITEM	TEST FOR	TEST STANDARD (ASTM OR OTHER TEST STANDARD)	FREQUENCY	FIRST TEST PAID FOR BY	RETESTS PAID FOR BY
Steel Pipe Fillet Welds and Lap Welds	Field Welding of Joints on Pipe Interior (Magnetic Particle Test)	AWWA C206 Section 5.2 and AWS D1.1 Upon test completion remove and flush all non NSF61-Compliant Materials from Pipe Interior	All interior steel pipe single-welded joints	Contractor	Contractor
	Field Inspection of Interior Welds	Visual Inspection per AWWA C206 Section 5.1 and Video-Camera Record of Pipe Interior Welding by Independent City-Accepted Inspection Agency. Verify absence of sharp edges, weld spatters, and burrs	All interior steel pipe single-welded joints	Contractor	Contractor

ITEM	TEST FOR	TEST STANDARD (ASTM OR OTHER TEST STANDARD)	FREQUENCY	FIRST TEST PAID FOR BY	RETESTS PAID FOR BY
Steel Pipe Butt Welds	Radiograph Inspection of Butt Welds	AWS D1.1	All stainless steel pipe butt welds in pipe 20" or larger	Contractor	Contractor
	Magnetic Particle Test	AWWA C206 Section 5.2 and AWS D1.1 Upon test completion remove and flush all non NSF61-Compliant Materials from Pipe Interior	All steel pipe butt-welded joints not x-ray tested	Contractor	Contractor
	Ultrasonic Test (Alternate to Magnetic Particle Test)	AWWA C206 Section 5.2 and AWS D1.1	All steel pipe butt-welded joints not x-ray tested	Contractor	Contractor
	Field Inspection	Visual Inspection of Pipe Interior Welds per AWWA C206 Section 5.1. Verify absence of sharp edges, weld spatters, and burrs	All steel pipe butt-welded joints	City	City

ITEM	TEST FOR	TEST STANDARD (ASTM OR OTHER TEST STANDARD)	FREQUENCY	FIRST TEST PAID FOR BY	RETESTS PAID FOR BY
Installed Steel Pipe	Cement-Mortar Lining of Joints	AWWA C602 Section 5.3 CCTV inspection of interior of finished installation	1 inspection of all steel pipe joints	Contractor	Contractor
	Hydrostatic Test	Section 306-1.4.5	All steel pipe	Contractor	Contractor
	Disinfection	Section 306-1.4.7 and AWWA C651.	All steel potable water pipe	Contractor	Contractor
	Anchorage and Support of Exposed Pipe	Visual inspection of finished installation. Support per UPC Table 3-1 and 3-2	1 inspection	City	City
	Installation & Leakage	Visual inspection of exterior of finished installation. No visible leaks	1 inspection	City	City
	11-month Warranty Inspection	Demonstrate compliance to Contract Documents and Manufacturer's printed literature	1 test	City	Contractor

ADD:

306-8.3.5

Pipe Protection.

At all times when pipe laying is not in progress, close open end of pipe with tight-fitting cap or plug to prevent entrance of foreign matter. These provisions shall apply during off hours as well as overnight. In no event shall pipeline be used as a drain for removing water which has infiltrated into trench. Contractor shall maintain inside of pipe free from foreign materials and in a clean and sanitary condition until acceptance by CITY'S Representative.

ADD:

306-8.3.6 Corrosion Protection.

A cathodic protection system shall be provided as shown on the plans and in accordance with Technicals Section 16640 Cathodic Protection System.

306-8.9.1 General. To the "GREENBOOK", ADD the following:

Welded steel pipe shall have a test pressure of 225 psi.

306-12.1 Backfill. To the "GREENBOOK", ADD the following:

Backfill shall be placed in uniform lifts not exceeding 8 inches in loose thickness.

306-15.1 General. To the "WHITEBOOK", add the following:

q) Draining and/or controlling water in pipelines.

306-15.5 Valves. To the "WHITEBOOK", Add with the following:

1. The bid item for Butterfly Valves does not include the 2 valve vaults on either side of the Interstate 8 trenchless crossing.
2. The valve vaults on either side of the Interstate 8 trenchless crossing shall be paid for under the bid item "**Butterfly Valve Vault**" and shall include the concrete vaults with access manholes, all steel hardware including the landing, ladders, grating and other miscellaneous metals, sump.
3. The bid item for gate valves does not include the valves associated with the main line valve bypasses or fire hydrant connections.

306-15.6 Hydrants. To the "WHITEBOOK", ADD the following:

The bid item for "Fire Hydrant assembly and marker" includes the 6" gate valve.

306-15.8 Pipeline Appurtenances. To the "WHITEBOOK", ADD the following:

10. For payment of the bid item "Insertion flow meters", refer to section 13414.

SECTION 307 – JACKING AND TUNNELING

307-2 TUNNELING OPERATIONS. To the "GREENBOOK", ADD the following:

1. Refer to the following attached Technical Specification Sections.
 - a) Section 02160 Pit Shaft Excavation and Support
 - b) Section 02341 Permeation Grouting
 - c) Section 02441 Contact Grouting
 - d) Section 02443 Microtunneling
 - e) Section 02445 Installation of Carrier Pipe in Steel Casing Pipe
 - f) Section 02496 Geotechnical Instrumentation
2. The trenchless pipeline construction shall be constructed per the following:
 - a) Define the location, depth and configuration of the launching and receiving shafts at the crossings; and the traffic management plans for

the proposed construction. Provide details of the proposed design(s), and submit the work plans and design calculations to the City for approval.

- b) Existing boring information suggested man made fill and/or soils of the Lindavista formation overlying the Stadium Conglomerate within the tunnel horizon. The Contractor shall assume a mixed face tunneling condition with Stadium Conglomerate found at the tunnel springline or below; and possibly a perched groundwater table at the interface.
- c) Advance at least one geotechnical exploratory (supplemental) boring adjacent to each of the proposed launching and receiving shafts at each crossing to 10-ft below proposed invert or 3-ft into top of the Stadium Conglomerate. The supplemental borings shall be completed within 30 days of NTP.
- d) Prepare and log the borings per requirements in Section 02496 of the specification. When groundwater is encountered in these borings, convert the boring into an observation well for monitoring of the groundwater table with a 5-ft long intake screen located halfway at the overburden soil/conglomerate interface. The Contractor shall assume at least one observation well will be installed at each crossing. These observation wells shall be protected and remain in service during the tunnel construction.
- e) Confirm the existing ground and groundwater conditions. Inform the City immediately if there are significant differences that may affect the proposed construction.
- f) Perform permeation grouting treatment within the tunnel horizon located 1-ft below the invert of the overlying 108-inch pipeline and the top of stadium Conglomerate. The Contractor shall use vertical, inclined or horizontal grout holes to completely solidify the targeted grout zone within the soil overburden and to minimize groundwater inflow during pipeline excavation. Perform the work per requirements in Section 02341 of the specification.
- g) Excavate and install the steel casing for the horizontal pipeline in accordance with the proposed line and grade and within the acceptable construction tolerances. Size the steel casing pipe per clearance envelope as indicated.
- h) The excavation and the installation of the steel casing may be performed by:
 - i. Microtunnel – Per Specification Section 02443 requirements (See the attached Technical Specification Sections.)
 - ii. Pipe Jacking with appropriate mechanical excavation tools or by hand with man access inside the pipe jacking pipe – Per section 307-2.1 of SSPWC.

- iii. Additional alternative(s) for the 108-inch SDCWA pipeline crossing shall be “Hand mining with underpinning support of the 108-inch pipeline”.
- 3. Submit proposed work plan, construction sequence, schedule, design calculations and details of the work to the Engineer for approval.
- 4. For hand mining work only:
 - a) Advance a minimum of two (2) 4-inch diameter probe holes (located near the crown and invert of the proposed excavation) at least 10-ft ahead of the front of the tunnel excavation to demonstrate adequacy of the ground treatment in controlling face stability and groundwater inflow. Perform additional grouting and/or install drain pipes with vacuum pump if necessary.
 - b) Perform continuous mining at a 24/7 schedule unless the front of the excavated face is covered with a 3-inch thick fiber reinforced shotcrete (per Section 02160 requirements) at end of each work shift or work stoppage.
- 5. Install the final carrier pipe per Section 02445 Installation of Carrier Pipe in Steel Casing (See the attached Technical Specification Sections.).
- 6. All submittals described herein for the two crossings shall be prepared and stamped by a professional engineer registered in the State of California.
- 7. Perform the shaft and tunneling work per Cal-OSHA requirements and permit conditions of the tunnel classification.

307-2.10

Payment. To the “GREENBOOK”, paragraph (1), DELETE in its entirety and SUBSTITUTE with the following:

- 1. **TUNNEL: 108” SDCWA Pipeline Crossing, Sta. 45+42 to 45+69** (Linear Feet) - This price shall compensate the Contractor for the planning, site investigation, design, and construction of a two-pass trenchless excavation and installation of the permanent carrier pipe from the Stationing shown on the plans. The price bid shall include full compensation for dewatering, permeation grouting, excavating, shoring, maintaining, backfilling and resurfacing access pits, furnishing and installing carrier pipe and casing pipe, casing spacers, end seals, and doing whatever else is appurtenant to tunnel construction. Assumptions for site and subsurface conditions, and performance of the required work are described in Section 307, 308 and 02443.
- 2. **TUNNEL: Interstate 8 Pipeline Crossing** (Linear Feet) - This price shall compensate the Contractor for the planning, site investigation, design, and construction of a two-pass trenchless excavation and installation of the casing and permanent carrier pipe underneath Interstate 8 from the Stationing shown on the plans. The price bid shall include full compensation for dewatering, permeation grouting, excavating, shoring, maintaining, backfilling and resurfacing access pits, geotechnical instrumentation, grouting, furnishing and installing casing, casing spacers, end seals and carrier pipes and doing whatever else is appurtenant to tunnel construction. Assumptions for site and

subsurface conditions, and performance of the required work are described in Section 307, 308 and 02443.

3. **Hyperbaric Intervention:** Payment for this is described in section 02443.

**ADD:
307-2.11**

Pipe.

1. **Wall Thickness.** Plate and sheet thickness shall conform to Section 209-2.1.
2. Joints for tunnel casing pipe shall be interlocking, push on type, direct-jacked, non-pressure, T5 by Permalok or approved equal specifically designed for pipe jacking. The joint shall be designed to withstand the anticipated groundwater hydrostatic pressure, slurry and lubricant injection pressures.

SECTION 308 - MICROTUNNELING.

To the "GREENBOOK", DELETE in its entirety and ADD the following:

For tunneling, see Section 307, Jacking and Tunneling and Section 02443, Microtunneling. (See the attached Technical Specification Sections.)

SECTION 314 - TRAFFIC STRIPING, CURB AND PAVEMENT MARKINGS, AND PAVEMENT MARKERS

314-4.3.7 **Payment.** To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. The payment for the removal and replacement of existing traffic striping, pavement markings, and pavement markers shall be included in the lump sum Bid item for "**Paint Striping**".
2. The payment for the new installations of traffic striping, pavement markings, and pavement markers, shall be included in the lump sum Bid item for "**Paint Striping**".

314-4.4.6 **Payment.** To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. No separate payment shall be made for establishing alignment for stripes and layout Work.
2. The payment for the removal and replacement of existing thermoplastic traffic striping, pavement markings, and pavement markers shall be included in the Bid item for "**Paint Striping**".
3. The payment for the installation of proposed thermoplastic striping as shown on the Plans shall be included in the Bid item for "**Paint Striping**" and shall include the payment for the installation of pavement markers.
4. The payment for the installation of proposed thermoplastic pavement markings as shown on the Plans shall be included in the Bid item for "**Paint Striping**".

5. The payment for the thermoplastic traffic striping of continental crosswalks shall be included in the Bid item for **"Paint Striping"** and shall include the payment for the removal of existing striping, pavement markers, and paving markings.

314-5.1 General. To the "GREENBOOK", ADD the following:

Pavement markers shall be replaced in kind unless noted otherwise.

SECTION 402 – UTILITES

402-2 PROTECTION. To the "WHITEBOOK", item 2, ADD the following:

- g) Refer to **Appendix O - Advanced Metering Infrastructure (AMI) Device Protection** for more information on the protection of AMI devices.

402-6 COOPERATION. To the "GREENBOOK", ADD the following:

1. Notify SDG&E at least **10 Working Days** prior to excavating within 10 feet of SDG&E Underground High Voltage Transmission Power Lines (69 KV and higher).

SECTION 601 - TEMPORARY TRAFFIC CONTROL FOR CONSTRUCTION AND MAINTENANCE WORK ZONES

601-2.1.2 Engineered Traffic Control Plans (TCP). To the "WHITEBOOK", ADD the following:

Engineered Traffic Control Plans have been included in the Contract for the majority of the project. The Contractor shall provide and maintain the Traffic Control devices to construct the work. Changes to the Traffic Control Plans requested by the Contractor and Traffic Control for Resurfacing shall conform to Sections 601-2 Traffic Control Plan (TCP).

601-7 PAYMENT. To the "WHITEBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. Payment for all temporary traffic control Work shall be included in the various items for the Work and **"Traffic Control"** Bid Item.
2. Installing, maintaining, repairing, replacing, and removing the K-rail, excavation and back-fill, drilling holes and grouting threaded rods or dowels when required, removing threaded rods or dowels and filling drilled holes with mortar, and moving and replacing removable panels as required, complete in place, as shown on the Plans, and in accordance with these specifications and the Special Provisions are included in the Bid item for **"Traffic Control"**.
3. Payments for traffic control Working Drawings, Traffic Control for Resurfacing, and Permits are included in the Bid item for **Traffic Control**.
4. Payment for Traffic Control Devices and any required signs and notices and detours is included in the lump sum Bid item for **Traffic Control** when Traffic Control Devices which may be required by the City, not included as separate Bid items, are included in the payment.

5. The following Traffic Control Devices will be included in the lump sum Bid item for **Traffic Control**:
 - a) Maintaining, repairing, replacing, and removing the Crash cushion modules, complete in place, as shown on the Plans and in accordance with these specifications and the Special Provisions are included in the lump sum Bid item for **Traffic Control**.
 - b) Maintaining, repairing, replacing, and removing the flashing arrow boards, complete in place, as shown on the Plans, and in accordance with these specifications and the Special Provisions are included in the lump sum Bid item for **Traffic Control**.
 - c) Flashing arrow boards and electronic message signs must be available for use 24 hours per day as required, without any additional payment for time or number of locations unless otherwise required for changed conditions and are included in the lump sum bid item for **Traffic Control**.
6. The payment for furnishing, installing, programming, maintaining, and removing the City approved temporary video or radar detection systems as specified in 601-1, "GENERAL" shall be included in the Bid item for each "Temporary Detection System" required at each intersection.

SECTION 700 – MATERIALS

700-1.5 Fiber Optic Subsystems. To the "WHITEBOOK", ADD the following:

Fiber optic conduit within all open trench sections shall be PVC pipe, Schedule 40, with push-on, gasketed joints rated for electrical use. Fiber optic conduit installed within the casings at the trenchless crossings shall be Schedule 40, Hot-dipped, galvanized steel with threaded ends. Conduit and fittings shall be manufactured in accordance with UL and ANSI standards and shall bear the UL label as applicable. Sweeps shall contain a minimum bend radius of 36". Warning tape shall be installed per Section 700-1.5.1.1. Concrete trench encasement shall be per Section 700-1.5.1.3. Pull boxes shall be precast concrete, rated for H-20 loads and spaced no further than four ¼ bends (360° total bends) or 1,000' apart whichever is less. Cover shall be flush mounted, galvanized, steel checker plate, skid resistant, bolt down, lockable, with the words "Fiber Optic" cast on it. Pullboxes shall be Christy, Brooks or approved equal.

700-5.1 Vehicle Detectors. To the "WHITEBOOK", item 1, DELETE in its entirety and SUBSTITUTE with the following:

1. Loop wire shall be Type 2. Loop detector lead-in cable shall be Type "B". Slots shall be filled with elastomeric sealant, epoxy sealant, or hot-melt rubberized asphalt sealant, except asphaltic emulsion loop sealant and cold tar loop sealant are acceptable if the pavement surface will receive an asphaltic concrete overlay.

SECTION 701 – CONSTRUCTION

701-2 PAYMENT. To the “WHITEBOOK”, ADD the following:

19. The payment for all electrical work will be included in the lump sum bid item **“Electrical Work”** unless otherwise noted and will include all work shown on the electrical plans and in the Technicals.
20. The payment for fiber optic conduit will be included in the lump sum bid item **“Fiber Optic Conduit”** and will include all fiber optic conduit, pull boxes and other work necessary for a complete installation.
21. The payment for protective railing Work per SDG-140, as called out as **“Curb Ramp Barricade”** in the plans, shall be included in the bid item **“Curb Ramp Barricade”**.
22. The payment for all work associated with removing and relocating the existing pedestrian barricades will be included in the bid item **“pedestrian barricade”**.

To the “WHITEBOOK”, item 5, sub-sections (l) and (n), DELETE in its entirety, and SUBSTITUTE with the following:

- l) The payment for removing equipment or removing and replacing equipment shall include surface restoration, pole base foundation, and wiring and shall be paid in the following bid items:
 - i. “Remove Existing Street Light”
 - ii. “Remove and Reinstall Traffic Signs”
 - iii. “Remove and Reinstall Existing Post Top Street Light Pole”
 - iv. “Remove and Reinstall Existing Light Pole”
 - v. “Remove Existing Pedestrian Push Button”
- n) The payment for new or modified street lighting systems shall include all components and Work to provide a functioning system and shall be included in the following Bid items:
 - i. “Street Lighting”
 - ii. “Streeting Lighting Electrical Sytem”
 - iii. “Standard Light Pole (Type A)”
 - iv. “Standard Light Pole (Type C”
 - v. “Type 15 Fixture with Pole”
 - vi. “Ameron #21CT13 #37 Pole or Equal”
 - vii. “Remove and Replace Capital Assembly and Luminaire”
 - viii. “Bidirectional Pedestrian Push Button”

SECTION 800 – MATERIALS

800-1 LANDSCAPING MATERIALS

800-1.1 Topsoil

800-1.1.1 General. To the “WHITEBOOK”, DELETE in its ENTIRETY and SUBSTITUTE with the following:

Topsoil shall be designated as Class C (unclassified). The Engineer will determine the suitability of topsoil prior to use. The Engineer may make such inspections and perform such tests as deemed necessary to determine that the material meets the requirements. Topsoil shall be transported from the source to its final position unless stockpiling is specified in the Special Provisions.

800-1.1.2 Class “A” Topsoil. To the “WHITEBOOK”, DELETE in its ENTIRETY.

800-1.1.3 Class “B” Topsoil. To the “WHITEBOOK” DELETE in its ENTIRETY.

800-1.2. Soil Fertilizing and Conditioning Materials.

800-1.2.1 General. DELETE in its ENTIRETY.

800-1.2.2 Manure. DELETE in its ENTIRETY.

800-1.2.3 Commercial Fertilizers. DELETE in its ENTIRETY.

800-1.2.3.1 Pre-plant Fertilizer and Tablets. DELETE in its ENTIRETY.

800-1.2.3.2 Post-plant Fertilizer. DELETE in its ENTIRETY.

800-1.2.4 Organic Soil Amendment. DELETE in its ENTIRETY.

800-1.2.6.1 Inorganic Soil Amendments. DELETE in its ENTIRETY.

800-1.3 Seed. DELETE in its ENTIRETY.

800-1.4 Plants. DELETE in its ENTIRETY.

800-2 IRRIGATION SYSTEM MATERIALS

800 2.1.2 Steel Pipe. DELETE in its ENTIRETY.

800-2.1.3.2 Pipe Sleeves. DELETE in its ENTIRETY.

800-2.1.4 Plastic Pipe for Use with Rubber Ring Gaskets. DELETE in its ENTIRETY.

800-2.1.5 Copper Pipe. DELETE in its ENTIRETY.

800-2.1.6 Concrete Thrust Blocks. DELETE in its ENTIRETY.

800-2.2 Valves and Valve Boxes.

800-2.2.2 Gate Valves. DELETE in its ENTIRETY.

800-2.2.3 Manual Control Globe Valves. DELETE in its ENTIRETY.

800-2.2.4 Remote Control Valves. DELETE in its ENTIRETY and SUBSTITUTE with the following:

1. Remote control valves shall be:
 - a. Electrically or hydraulically operated.

- b. Equipped with flow control adjustment and capability for manual operation.
 - c. Made so that they may be readily disassembled for servicing.
2. Plastic remote control valves shall be electrically operated.
 3. Unless otherwise specified, the valve body shall be constructed of heavy-duty glass-filled UV-resistant nylon and have stainless steel studs and flange nuts. Diaphragms shall be of nylon reinforced nitrile rubber with accurately machined valve seat surfaces equipped with flow control adjustments and shall be capable of manual operation. All internal parts shall be removable from the top of the valve without disturbing the valve installation.

800-2.2.5 Garden Valves. DELETE in its ENTIRETY.

800-2.2.7 Valve Boxes. DELETE in its ENTIRETY and SUBSTITUTE with the following:

1. Valve boxes shall be constructed of plastic.
2. A manufactured weatherproof plastic identification tag showing the irrigation controller and station shall be affixed to the colored conductor wire in each valve and pull box.

800-2.2.8 Master Control Valve. DELETE in its ENTIRETY.

800-2.2.9 Flow Sensing Device. DELETE in its ENTIRETY.

800-2.2.10 Flow Sensor Cable. DELETE in its ENTIRETY.

800-2.2.12 Locking Manual Valve Cap. DELETE in its ENTIRETY.

800-2.2.13 Pressure Regulating Valve. DELETE in its ENTIRETY.

800-2.2.14 Wye Strainer. DELETE in its ENTIRETY.

800-2.2.16 Anti-drain Check Valve. DELETE in its ENTIRETY.

800-2.2.17 Booster Pump. DELETE in its ENTIRETY.

800-2.4.1.1 Pressure Regulator. DELETE in its ENTIRETY.

800-2.4.1.3 Air Relief Valve. DELETE in its ENTIRETY.

800-2.4.1.4 Flush Valve. DELETE in its ENTIRETY.

800-2.4.1.5 Drip Emitter. DELETE in its ENTIRETY.

800-2.4.1.6 Drip Tubing. DELETE in its ENTIRETY.

800-2.5 Extra Equipment to Be Furnished. DELETE in its ENTIRETY and SUBSTITUTE with the following:

1. You shall provide the following to the City prior to the final Acceptance, unless otherwise specified on the Plans or Special Provisions:
 - a. Five (5) irrigation heads with nozzles of each type used for every 100 irrigation heads or portions thereof.

- b. Two (2) sets of special tools required for removing, disassembling, and adjusting each type of sprinkler and valve supplied on the project.
- c. Two (2) sets of 5 foot (1.5 m) valve keys for every 20 gate valves installed or portions thereof.
- d. Two (2) sets of keys for each automatic controller, locking valve box, and locking quick coupler.
- e. Two (2) sets of valve keys for every 20 quick coupler assemblies installed or portions thereof.

SECTION 801 – INSTALLATION

801-1 GENERAL. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

- 1. This section includes specifications for the preparation, hydroseeding, and irrigation system construction for landscape areas shown on the Plans.
- 2. Unless otherwise specified, irrigation systems, and similar improvements shall be constructed following rough grading and before landscaping.
- 3. Work on the irrigation system including hydrostatic tests, backfill and densification of trenches, and other excavations shall be performed before topsoil placement. Preliminary operational tests of the automatic control system and coverage tests shall be performed after top soil placement.

801-2 EARTHWORK AND TOPSOIL PLACEMENT.

801-2.1 General. To the “WHITEBOOK”, DELETE in its ENTIRETY and SUBSTITUTE with the following:

Earthwork shall include the preparation for the densification, cultivation, and raking of topsoil.

Preliminary rough grading and related work to prepare areas for landscaping work to within 0.1 foot (30 mm) of finish grade, or to subgrade for Class B topsoil

801-2.2 Topsoil Preparation and Conditioning.

801-2.2.1 General. To the “WHITEBOOK”, DELETE in its ENTIRETY and SUBSTITUTE with the following:

- 1. Planting areas shall be free of weeds and other extraneous materials to a depth of 10 inches (254 mm) below finish grade before topsoil Work.
- 2. Soil shall not be worked when it is so wet or so dry as to cause excessive compaction or the forming of hard clods or dust.

3. Class "C" topsoil shall be scarified and cultivated to a finely divided condition to a depth of 8 inches (203.2 mm) minimum below finish grade. During this operation, all stones over ½ inches (12.7 mm) in greatest dimension shall be removed.
4. After compaction, topsoil shall be within ± 0.1 foot (0.3 m) of finish grade.

801-2.2.2 Fertilizing and Conditioning Procedures. DELETE in its ENTIRETY.

801-2.3 Finish Grading. To the "WHITEBOOK", DELETE in its ENTIRETY and SUBSTITUTE with the following:

1. The finish grade shall be smooth, uniform, and free of abrupt grade changes and depressions to ensure surface drainage.
2. The soil shall be watered and allowed to settle to provide a stable surface. After the soil has dried out to a workable condition, the planting areas shall be regraded, raked, and smoothed to the required grades and contours.
3. Topsoil shall be mechanically compacted to a minimum relative compaction of 85%. Finish surfaces shall be clean and suitable for planting.

801-9 PAYMENT. To the "WHITEBOOK", DELETE in its ENTIRETY and SUBSTITUTE with the following:

1. The payment for landscaping and irrigation Work shall be included under the lump sum Bid items "**Landscape Work**" and "**Irrigation System**" as shown in the Bid and shall include the payment for the Plant Establishment Period.

SECTION 802 – NATIVE HABITAT PROTECTION, INSTALLATION, MAINTENANCE, AND MONITORING

802-2.1 Project Biologist. To the "WHITEBOOK", ADD the following:

5. The City will retain a qualified Project Biologist to perform biological monitoring Work for this Contract. You shall coordinate your activities and Schedule with the activities and schedules of the Project Biologist.

802-4 PAYMENT. To the "WHITEBOOK", item 1, subsection "e", DELETE in its entirety and SUBSTITUTE with the following:

- e) The payment for the reporting and maintenance Work required during the maintenance period beyond the PEP in accordance with the Long-Term Maintenance and Monitoring Agreement (LTMMMA) included in the Contract Documents includes payment for all coordination with the City Biologist, furnishing the required reports, site observations, and bond(s), and shall be included in the lump sum Bid item for the "**25-Month Revegetation Maintenance and Monitoring Program**".

SECTION 900 – MATERIALS

900-2.3 **Payment.** To the “WHITEBOOK”, item 3, DELETE in its entirety and SUBSTITUTE with the following:

3. The payment for furnishing materials for your connection, cut and plug, and cut-in Work shall cover all necessary materials (fittings and hardware, excluding valves), delivery, and unloading. The payment shall be included within the Bid item of the Work involved and no separate payment for furnishing those materials shall be made. The payment for furnishing valve materials for your connection, cut and plug, and cut-in Work shall be included in the separate Bid items for each valve.

SECTION 1001 – CONSTRUCTION BEST MANAGEMENT PRACTICES (BMPs)

1001-2.10 **BMP Inspection, Maintenance, and Repair.** To the “WHITEBOOK”, ADD the following:

5. Maintenance activities shall be documented by the QSP or QSD in the Construction BMP Maintenance Log for projects subject to SWPPP requirements. See **Appendix F - SWPPP Construction BMP Maintenance Log.**

1001-3.7 **Payment.** To the “WHITEBOOK”, item 3, subsection “g”, **DELETE** in its entirety and **SUBSTITUTE** with the following:

- g) BMP Inspection, Maintenance, Repair, and Construction BMP Maintenance Log.

END OF SUPPLEMENTARY SPECIAL PROVISIONS (SSP)

TECHNICALS

Table of Contents

DIVISION 01 – GENERAL REQUIREMENT

01300 Contractor Submittals

DIVISION 02 – SITEWORK

- 02160 Pit Shaft Excavation and Support
- 02341 Permeation Grouting
- 02441 Contact Grouting
- 02443 Microtunneling
- 02445 Installation of Carrier Pipe in Steel Casing Pipe
- 02496 Geotechnical Instrumentation
- 03481 Precast Concrete Utility Structures

DIVISION 13 – SPECIAL CONSTRUCTION

- 13300 Instrumentation and Control
- 13374 Control Panel Instrumentation
- 13414 Insertion Magnetic Flowmeter

DIVISION 15 – MECHANICAL

- 15102 Triple Offset Metal Seated Butterfly Valve

DIVISION 16 – ELECTRICAL

- 16010 Basic Electrical Requirements
- 16110 Raceways
- 16120 Wires and Cables
- 16190 Supporting Devices
- 16195 Electrical Identification
- 16421 Utility Service Entrance
- 16450 Grounding
- 16640 Cathodic Protection System
- 16950 Electrical Tests

SECTION 01300

CONTRACTOR SUBMITTALS

PART 1 – GENERAL

1.1 GENERAL

- A. Wherever submittals are required hereunder, all such submittals by the CONTRACTOR shall be submitted to the CONSTRUCTION MANAGER.
- B. Within seven (7) calendar days after the date of commencement as stated in the Notice to Proceed (NTP), the CONTRACTOR shall submit the following items to the CONSTRUCTION MANAGER for review:
 - 1. A preliminary schedule of Shop Drawings, Samples, and submittals listed in the Bid.
 - 2. A list of all permits and licenses the CONTRACTOR shall obtain indicating the agency required to grant the permit and the expected date of submittal for the permit and required date for receipt of the permit.
- C. At the preconstruction conference, the CONTRACTOR shall submit the following items to the CONSTRUCTION MANAGER for review:
 - 1. A 60-day plan of operation in accordance with Greenbook/Whitebook.
 - 2. A project overview bar chart in accordance with Greenbook/Whitebook.
 - 3. A preliminary schedule of values in accordance with Greenbook/Whitebook.

1.2 SHOP DRAWINGS

- A. Wherever called for in the Contract Documents, or where required by the CONSTRUCTION MANAGER, the CONTRACTOR shall furnish to the CONSTRUCTION MANAGER for review, 6 copies, plus the number the CONTRACTOR wants returned, not to exceed 12 copies, plus one reproducible copy, of each shop drawing submittal. The term "Shop Drawings" as used herein shall be understood to include detail design calculations, shop drawings, fabrication, and installation drawings, erection drawings, lists, graphs, catalog sheets, data sheets, and similar items.
- B. All shop drawing submittals shall be accompanied by the CONSTRUCTION MANAGER's standard submittal transmittal form. The form may be obtained from the CONSTRUCTION MANAGER. Any submittal not accompanied by such a form, or where all applicable items on the form are not completed, will be returned for resubmittal.
- C. Normally, a separate transmittal form shall be used for each specific item or class of material or equipment for which a submittal is required. Transmittal of a submittal of

various items using a single transmittal form will be permitted only when the items taken together constitute a manufacturer's "package" or are so functionally related that expediency indicates review of the group or package as a whole. A multiple-page submittal shall be collated into sets, and each set shall be stapled or bound, as appropriate, prior to transmittal to the CONSTRUCTION MANAGER.

- D. Except as may otherwise be indicated herein, the CONSTRUCTION MANAGER will return prints of each submittal to the CONTRACTOR with its comments noted thereon, within 15 calendar days following their receipt by the CONSTRUCTION MANAGER. It is considered reasonable that the CONTRACTOR shall make a complete and acceptable submittal to the CONSTRUCTION MANAGER by the second submission of a submittal item. The OWNER reserves the right to withhold monies due the CONTRACTOR to cover additional costs of the CONSTRUCTION MANAGER's review beyond the second submittal. The CONSTRUCTION MANAGER'S maximum review period for each submittal, including all resubmittals, will be 15 days per submittal. In other words, for a submittal that requires two resubmittals before it is complete, the maximum review period for that submittal could be 45 days.
- E. If three (3) copies of a submittal are returned to the CONTRACTOR marked "NO EXCEPTIONS TAKEN," formal revision and resubmission of said submittal will not be required.
- F. If three (3) copies of a submittal are returned to the CONTRACTOR marked "MAKE CORRECTIONS NOTED," formal revision and resubmission of said submittal will not be required.
- G. If a submittal is returned to the CONTRACTOR marked "AMEND-RESUBMIT," the CONTRACTOR shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the CONSTRUCTION MANAGER.
- H. If a submittal is returned to the CONTRACTOR marked "REJECTED-RESUBMIT," the CONTRACTOR shall revise said submittal and shall resubmit the required number of copies of said revised submittal to the CONSTRUCTION MANAGER.
- I. Fabrication of an item shall be commenced only after the CONSTRUCTION MANAGER has reviewed the pertinent submittals and returned copies to the CONTRACTOR marked either "NO EXCEPTIONS TAKEN" or "MAKE CORRECTIONS NOTED." Corrections indicated on submittals shall be considered as changes necessary to meet the requirements of the Contract Documents and shall not be taken as the basis for changes to the contract requirements.
- J. All CONTRACTOR shop drawing submittals shall be carefully reviewed by an authorized representative of the CONTRACTOR, prior to submission to the CONSTRUCTION MANAGER. Each submittal shall be dated, signed, and certified by the CONTRACTOR, as being correct and in strict conformance with the Contract Documents. In the case of shop drawings, each sheet shall be so dated, signed, and certified. No consideration for review by the CONSTRUCTION MANAGER of any CONTRACTOR submittals will be made for any items which have not been so certified by the CONTRACTOR. All non-certified submittals will be returned to the CONTRACTOR without action taken by the CONSTRUCTION MANAGER, and any delays caused thereby shall be the total responsibility of the CONTRACTOR.

- K. The CONSTRUCTION MANAGER's/ENGINEER's review of CONTRACTOR shop drawing submittals is for general conformance with the design concept and contract documents only and shall not relieve the CONTRACTOR of the entire responsibility for the correctness of details and dimensions. The CONTRACTOR shall assume all responsibility and risk for any misfits due to any errors in CONTRACTOR submittals. The CONTRACTOR shall be responsible for the dimensions and the design of adequate connections and details. Markings or comments shall not be construed as relieving the CONTRACTOR from compliance with the project plans and specifications or departures therefrom. The CONTRACTOR remains responsible for details and accuracy for confirming and correlating all quantities and dimensions, for selecting fabrication processes, the techniques of assembly, and for performing his work in a safe manner.

1.3 CONTRACTOR'S SCHEDULE

- A. The CONTRACTOR's construction schedules and reports shall be prepared and submitted to the CONSTRUCTION MANAGER.

1.4 SAMPLES

- A. Whenever in the Specifications samples are required, the CONTRACTOR shall submit not less than three (3) samples of each such item or material to the CONSTRUCTION MANAGER for acceptance at no additional cost to the OWNER.
- B. Samples, as required herein, shall be submitted for acceptance a minimum of 21 days prior to ordering such material for delivery to the jobsite, and shall be submitted in an orderly sequence so that dependent materials or equipment can be assembled and reviewed without causing delays in the WORK.
- C. All samples shall be individually and indelibly labeled or tagged, indicating thereon all specified physical characteristics and Manufacturer's name for identification and submitted to the CONSTRUCTION MANAGER for acceptance. Upon receiving acceptance of the CONSTRUCTION MANAGER, one set of the samples will be stamped and dated by the CONSTRUCTION MANAGER and returned to the CONTRACTOR, and one set of samples will be retained by the CONSTRUCTION MANAGER, and one set of samples shall remain at the job site until completion of the WORK.
- D. Unless indicated otherwise, all colors and textures of specified items presented in sample submittals shall be from the manufacturer's standard colors and standard materials, products, or equipment lines. If the samples represent non-standard colors, materials, products, or equipment lines and their selection will require an increase in contract time or price, the CONTRACTOR will clearly indicate same on the transmittal page of the submittal.

1.5 OWNER'S MANUALS (OR OPERATION AND MAINTENANCE MANUALS)

- A. The CONTRACTOR shall submit technical operation and maintenance information for each item of mechanical, electrical and instrumentation equipment in an organized manner in the OWNER'S MANUALS (OR OPERATION AND MAINTENANCE MANUALS). The OWNER'S MANUALS (OR OPERATION AND MAINTENANCE MANUALS) shall be written so that it can be used and understood by the OWNER'S operation and maintenance staff. Each individual force main and the generator shall have its own independent and unique OWNER'S MANUAL (OR OPERATION AND MAINTENANCE MANUALS).
- B. Each OWNER'S MANUAL (OR OPERATION AND MAINTENANCE MANUALS) shall be subdivided first by specification section number; second, by equipment item; and last, by "part." "Parts" shall conform to the following (as applicable):
1. Part 1 - Equipment Summary
 - a. Summary: A summary table shall indicate the equipment name, equipment number, and process area in which the equipment is installed.
 - b. Form: The CONSTRUCTION MANAGER will supply an Equipment Summary Form for each item of mechanical, electrical and instrumentation equipment in the WORK. The CONTRACTOR shall fill in the relevant information on the form and include it in Part 1.
 2. Part 2 - Operational Procedures
 - a. Procedures: Manufacturer-recommended procedures on the following shall be included in Part 2:
 - (1) Installation
 - (2) Adjustment
 - (3) Startup
 - (4) Location of controls, special tools or other equipment required or related instrumentation needed for operation
 - (5) Operation Procedures
 - (6) Load Changes
 - (7) Calibration
 - (8) Shutdown
 - (9) Troubleshooting
 - (10) Disassembly
 - (11) Reassembly
 - (12) Realignment
 - (13) Testing to determine performance efficiency
 - (14) Tabulation of proper settings for all pressure relief valves, low and high pressure switches and other protection devices
 - (15) List of all electrical relay settings including alarm and contact settings
 3. Part 3 - Preventive Maintenance Procedures
 - a. Procedures: Preventive maintenance procedures shall include all manufacturer-recommended procedures to be performed on a periodic basis, both by removing and replacing the equipment or component and by leaving the equipment in place.
 - b. Schedules: Recommended frequency of preventive maintenance procedures shall be included. Lubrication schedules, including

lubricant SAE grade and type, and temperature ranges shall be covered.

4. Part 4 - Parts List

- a. Parts List: A complete parts list shall be furnished, including a generic description and manufacturer's identification number for each part. Addresses and telephone numbers of the nearest supplier and parts warehouse shall be included.
- b. Drawings: Cross-sectional or exploded view drawings shall accompany the parts list.

5. Part 5 - Wiring Diagrams

- a. Diagrams: Part 5 shall include complete internal and connection wiring diagrams for electrical equipment items.

6. Part 6 - Shop Drawings

- a. Drawings: This part shall include approved shop or fabrication drawings, complete with dimensions.

7. Part 7 - Safety

- a. Procedures: This part describes the safety precautions to be taken when operating and maintaining the equipment or working near it.

8. Part 8 - Documentation

- a. All equipment warranties, affidavits, and certifications required by the Technical Specifications shall be placed in this part.

- C. The CONTRACTOR shall furnish to the CONSTRUCTION MANAGER seven (7) identical OWNER'S MANUALS (OR OPERATION AND MAINTENANCE MANUALS). Each set shall consist of one or more volumes, each of which shall be bound in a standard size, 3-ring, looseleaf, vinyl plastic hard cover binder suitable for bookshelf storage. Binder ring size shall not exceed 2.5 inches. A table of contents indicating all equipment in the manuals shall be prepared.
- D. OWNER'S MANUALS (OR OPERATION AND MAINTENANCE MANUALS) shall be submitted in final form to the CONSTRUCTION MANAGER not later than the 75 percent of construction completion date. All discrepancies found by the CONSTRUCTION MANAGER in the OWNER'S MANUALS (OR OPERATION AND MAINTENANCE MANUALS) shall be corrected by the CONTRACTOR within 15 calendar days from the date of written notification by the CONSTRUCTION MANAGER.
- E. Incomplete or unacceptable OWNER'S MANUALS (OR OPERATION AND MAINTENANCE MANUALS) at the 75 percent construction completion point shall

constitute sufficient justification to withhold the amount stipulated in paragraph "OWNER'S MANUAL (OR OPERATION AND MAINTENANCE MANUALS) Submittals" of Section 01700, from any monies due the CONTRACTOR.

1.6 INSTRUCTION OF OWNER'S PERSONNEL

A. **General:**

1. Training is not generally a part of the contract, unless it is specifically called out in the technical specifications. If the OWNER determines that certain training is desired on a particular component or a portion of the contract not required of the technical specifications, a field order or change order will be executed in order to facilitate such training for the wastewater collections staff.

1.7 ELECTRONIC DOCUMENT SUBMITTAL REQUIREMENTS

A. **General**

1. All final submittals are required in both paper and electronic format. Four (4) copies of each final submittal shall be provided on compact disk media (CD-ROM).
2. Where preliminary submittals are required in electronic format, three (3) copies of the preliminary submittal shall be provided on CD-ROM for review.
3. CD-ROM disks shall be on high-quality CD-R media. CDs shall have printed paper labels with the project name, CIP Number, CONTRACTOR, and content. CD-RW (CD-rewritable) disks are not acceptable. CDs shall be provided with a case and a case insert label displaying the same information shown on the CD label.
4. The CD-ROM data format shall comply with ISO 9660 (2010) with Joliet extensions.
5. Deviation from this standard will be accepted only if advance approval is given by the CONSTRUCTION MANAGER.

B. **Documents:** Electronic submittals for the following types of documents are required as a minimum. Additional requirements are identified in the equipment specifications.

1. Design
 - a. Design Specifications
 - b. Design Drawings and record drawings
1. Operations and Maintenance
 - a. Facility design O&M manuals

- (1) Volume I - process information
 - (2) Volume II - standard operating procedures (SOP)
 - (3) Volume III - all maintenance information for the facility.
 - (4) Manufacturer O&M manuals
 - (5) Facility Loop and Wiring Diagrams
2. Environmental Documents
 3. Research & Development

C. Format

1. Construction drawings and record drawings developed under the Contract shall be in Bentley Microstation (DGN V8 version) format. All drawings shall conform to the CADD and Drafting standards set forth in the CWP Guidelines, latest edition.
2. Other than construction drawings and record drawings, documents shall be in Adobe Acrobat PDF format, using the Acrobat version as specified by the CONSTRUCTION MANAGER. Documents that are submitted in Acrobat Image Only format will not be accepted.
3. Electronic Conversion: Vendor and CONTRACTOR shop drawings developed under the Contract shall be in Bentley Microstation (DGN) format. Documents in electronic format (Microsoft Word, Excel, etc.) shall be converted to standard PDF format using the Acrobat printer driver or other direct conversion software. The Acrobat PDF sub-format for electronically converted documents shall be the Acrobat Standard PDF file format which includes both image and text information.
4. Documents not available in electronic format shall be scanned at 300 dpi, bitonal (black and white) and converted into Adobe Acrobat (PDF). Image enhancement software shall be used during scanning. The Acrobat PDF sub-format for scanned documents shall be the Original Image with Hidden Text format.
5. All PDF documents shall be reviewed, and corrected if necessary, for orientation and legibility.
6. Individual document files shall not exceed 3 megabytes in size. Large documents shall be broken down by subsections to facilitate this requirement

D. Document Organization and Indexing

1. Electronic submittals shall be logically organized. File names shall be in UPPERCASE only, use a maximum of 64 characters, contain no spaces, and clearly indicate the file contents.
2. Supplier's submittals that include O&M documentation for more than one equipment type shall be divided into separate documents for each equipment type.

3. Each document's Table of Contents shall contain PDF bookmarks which actively link to the referenced sections within the document.
4. A master PDF index file shall be included, with a master Table of Contents, and active internal links to individual document files. The master PDF index file shall be clearly identifiable. External PDF link file names shall be in uppercase only.
5. A table shall be provided and submitted in spreadsheet format which includes the information about each document file. The contents of the table shall be submitted and approved by the CONSTRUCTION MANAGER. An example of information to be provided is as follows: (This is an example only.)

b. Document file name

- (1) Document title and description
- (2) Hard Copy Catalog No. (used by facility document coordinator)
- (3) Document Type: (see above)
- (4) Facility Name
- (5) Specification Number
- (6) Process Name
- (7) Unit Process Number
- (8) Manufacturer's Name (if applicable)
 - (9) Supplier's Name (if applicable)
 - (10) EMPAC asset number (if applicable)
 - (11) Asset Description (if applicable)
 - (a) Keyword
 - (b) Qualifier

1.8 SPARE PARTS LIST

- A. The CONTRACTOR shall furnish to the CONSTRUCTION MANAGER five (5) identical sets of spare parts information for all mechanical, electrical, and instrumentation equipment. The spare parts list shall include the current list price of each spare part. The spare parts list shall be limited to those spare parts which each manufacturer recommends be maintained by the OWNER in inventory at the plant site. Each manufacturer or supplier shall indicate the name, address, and telephone number of its nearest outlet of spare parts to facilitate the OWNER in ordering. The CONTRACTOR shall cross-reference all spare parts lists to the equipment numbers designated in the Contract Documents. The spare parts lists shall be bound in standard size, 3-ring, looseleaf, vinyl plastic hard cover binders suitable for bookshelf storage. Binder ring size shall not exceed 2.5 inches.

1.9 RECORD DRAWINGS (one component of the Project Master Record Documents as identified in specification)

- A. The CONTRACTOR shall keep and maintain, at the job site, one record set of Drawings. On these, it shall mark all project conditions, locations, configurations, and any other changes or deviations which may vary from the details represented on the original Contract Drawings, including buried or concealed construction and utility features which are revealed during the course of construction. Special attention shall

be given to recording the horizontal and vertical location of all buried utilities that differ from the locations indicated, or which were not indicated on the Contract Drawings. Said record drawings shall be supplemented by any detailed sketches as necessary or directed to indicate, fully, the WORK as actually constructed. These master record drawings of the CONTRACTOR's representation of as-built conditions, including all revisions made necessary by addenda and change orders shall be maintained up-to-date during the progress of the WORK.

- B. Copies of the record drawings shall be submitted on the 20th working day of every month after the month in which the notice to proceed is given as well as on completion of WORK. Failure to submit complete record drawings on or before the 20th working day will enact the liquidated damages clause for interim record drawings submittals described in Article 3 of the Agreement.
- C. In the case of those drawings which depict the detail requirement for equipment to be assembled and wired in the factory, such as motor control centers and the like, the record drawings shall be updated by indicating those portions which are superseded by change order drawings or final shop drawings, and by including appropriate reference information describing the change orders by number and the shop drawings by manufacturer, drawing, and revision numbers.
- D. Record drawings shall be accessible to the CONSTRUCTION MANAGER at all times during the construction period.
- E. Final payment will not be acted upon until the CONTRACTOR-prepared record drawings have been delivered to the CONSTRUCTION MANAGER. Said up-to-date record drawings shall be in the form of a set of prints with carefully plotted information overlaid in red.
- F. Upon substantial completion of the WORK and prior to final acceptance, the CONTRACTOR shall finalize and deliver a complete set of record drawings to the CONSTRUCTION MANAGER for transmittal to the OWNER, conforming to the construction records of the CONTRACTOR. This set of drawings shall consist of corrected drawings showing the reported location of the WORK. The information submitted by the CONTRACTOR in the Record Drawings will be assumed to be correct, and the CONTRACTOR shall be responsible for the accuracy of such information, and for any errors or omissions which may appear on the Record Drawings as a result.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

****END OF SECTION****

SECTION 02160
PIT/SHAFT EXCAVATION AND SUPPORT

PART 1 -- GENERAL

1.1 SCOPE OF WORK

- A. The Work specified in this Section includes the requirements for design and construction of pits and shafts through overburden soils into Stadium Conglomerate at the I-8 crossing and likely Stadium Conglomerate with fill soils at the SDCWA 108-inch crossing and for application of microtunneling and/or other trenchless excavation methods to complete the construction of the proposed pipeline. Furnish all materials, equipment, labor, and services necessary to perform all operations to complete the Work.
- B. The CONTRACTOR shall be completely responsible for the design, performance and safety of the excavation support systems.

1.2 RELATED SECTIONS

- A. Section 02341 Permeation Grouting
- B. Section 02443 Microtunneling
- C. Section 02445 Installation Of Carrier Pipe In Steel Casing
- D. Section 02496 Geotechnical Instrumentation

1.3 REFERENCE CODES AND STANDARDS

- A. Unless otherwise indicated, the current editions of the following specifications and standards apply to the Work of this Section.
- B. American Society for Testing and Materials (ASTM):
 - 1. A615, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
 - 2. A36, Standard Specifications for Carbon Structural Steel
 - 3. D1557, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort
 - 4. American National Standards Institute/American Welding Society (ANSI/AWS) D1.1: Structural Welding Code

5. Caltrans Encroachment Permits, "Guidelines and Specifications for Trenchless Technology Projects" (Please refer to **Appendix J**)
6. "Greenbook", Standard Specifications for Public Works Construction (SSPWC), and per latest revisions by City of San Diego White Book
7. American Institute of Steel Construction (AISC): Steel Construction Manual
8. American Association of State Highway and Transportation Officials (AASHTO): Standard Specifications for Highway Bridges
9. Cal/OSHA: State of California Administrative Code, Title 8
10. Occupational Safety and Health Administration (OSHA) Regulations: 29 CFR

C. California Labor Code, Section 6705, Shoring and Bracing Drawings

1.4 DEFINITIONS

- A. Break-ins and break-outs: Tunnel and pipeline penetrations for connections into and out of shafts.
- B. Pit: A vertical opening where the depth of the excavation is less than the long dimensions of the excavation. The word "pit" and "shaft" are used interchangeably in this specification.
- C. Shaft: A vertical opening where the depth of the excavation is more than the long dimensions of the excavation. The word "pit" and "shaft" are used interchangeably in this specification.
- D. Dewatering: Any system of wells and pumps used for the sole purpose of lowering the groundwater or removing groundwater from within an excavation or lowering the groundwater below a required elevation.
- E. Trigger Levels: Action level or maximum allowable level for ground movement.
- F. Rock: Solid rock, hard ledge rock, clasts and conglomerate, that can only be removed by pneumatic or equivalent tools shall be classified as rock in this contract.

1.5 DESIGN CRITERIA

- A. Develop site specific designs for the support of all shafts and pits as required during the Work. These criteria are intended to serve as guides and are the minimum acceptable considerations.
- B. Utilize excavation support systems compatible with the geological conditions indicated in the Geotechnical Report.

- C. The design of the soldier pile and lagging system shall comply with the latest AASHTO LRFD Bridge Design Specification, and shall also take into account, as a minimum, the earth and hydrostatic loads; construction loads such as the maximum anticipated jacking forces and surcharge; ground treatment, stresses imposed during handling and installation; necessary space required for permanent structures; methods to provide groundwater controls inside the pit/shaft; surcharge from traffic and construction loads, protection of adjacent facilities, and other construction operations.
- D. Design shall be in accordance with minimum criteria and information for design described in the Geotechnical Report, with due considerations of the uneven terrain of the bedrock at each shaft location.
- E. Carry bottom of shoring to a depth below main excavation adequate to prevent lateral movement and to obtain adequate vertical support. In areas where additional excavation is required below main excavation subgrade, prevent movement of main excavation supports.
- F. Exact locations, configurations and dimensions of the pits and shafts are to be determined by the CONTRACTOR. Locate and size pits and shafts to conform within the limitations as indicated on the Drawings and traffic management plans, and to accommodate the selected means and methods for performing the work and construction of permanent structures.
- G. Monitor and protect in-place surface and subsurface facilities as indicated or located within a 1V:1H (vertical to horizontal) influence line measured upward and outward from the invert of the shaft excavated perimeter until the shaft is completely backfilled.
- H. The CONTRACTOR shall perform remedial measures to control the groundwater inflows and to properly dispose all the water collected. Design of the groundwater control system shall also incorporate the use of curtain grout wall, ring seal, top hat, special reinforcement of the wall elements such as ring beam, stiffeners, ground treatment, and/or other approved methods for launching or receiving microtunneling equipment.
- I. The thrust block shall be normal (square) with the proposed pipe alignment and shall be designed to withstand the maximum jacking pressure anticipated with a factor of safety of at least 3.0, without excessive deflection or displacement.
- J. Acceptable excavation support systems for shaft or pit:
 - 1. Soldier pile to be installed inside pre-excavated bore hole supported by slurry or steel casing;
 - 2. Lagging
 - a. Overburden Soils – Timber or steel plate

- b. Stadium Conglomerate – Shotcrete lagging or steel liner plates and steel ribs (for circular shaft only)
 - 3. Construct a finished concrete slab at the launching and receiving shaft inverts with minimum 6-inch thick mud slab with compressive strength of 2,000 psi in the dry overlying a minimum 12-inch thick coarse drainage stone above a filter fabrics mat.
- K. Ground improvement methods at shaft break-in and break-out shall include:

- 1. Permeation grouting per Section 02341 - minimum dimensions of the break-in and break-out are
 - a Width & Height = 2 times excavated diameter of the MTBM; centering at the springline of the proposed alignment; and
 - b. Length = 2.5 times excavated diameter of the MTBM and as indicated; as measured from the outside face of the shoring support

Permeation grout treatment can be installed either from the ground surface or at shaft bottom.

AND

- 2. Pre-excavation rock spiling or grouted in place dowels to form an arch canopy above the break-in and break-out as indicated after completion of the permeation grouting. Perform the Work and proof tested the installed bolts per manufacturer's recommendations.

L. Dewatering

- 1. For external groundwater control - The CONTRACTOR shall use temporary dewatering with deep well or well point system to be installed inside the curtain grout wall to minimize the groundwater inflows into the pit/shaft excavation to acceptable quantities specified herein and Section 02443. When applicable, design the dewatering system per requirements in City Supplement (White book) Section 3-12.8 and to avoid extensive drawdown of the groundwater table outside the shaft.
- 2. For inside the shaft groundwater control - The CONTRACTOR shall use weep holes, panning, perimeter drain and sump pumping system to control any nuisance water inside the shaft. Install the sump pit extending 6-inch below the top of the drainage stone for removal of any seepage water and to lower the groundwater table inside the shaft to below the top of the mud slab.
- 3. Use in combination with approved shoring method to facilitate the completion of the shaft or pit excavation.

4. Seepage water shall be collected, treated and conveyed to the closest receiving facilities as indicated. The alignment of the discharge line shall be subject to approval by the Engineer. Alternatively, the seepage water shall be stored in tanks and haul off site for periodic disposal. Use a local recycling/treatment/disposal facility approved by the City.

M. Tolerances

1. Limits of Shaft: Within plus or minus 0.25 feet from the planned or approved locations.
2. Top and Invert Elevation of Shaft: Within plus or minus 0.2 feet from the planned elevation.

1.6 Performance requirements

- A. All soldier pile installation shall be placed inside a pre-drilled bore hole of sufficient diameter
- B. Excavation in Stadium Conglomerate is anticipated to be difficult due to the presence of large clasts (boulders) and cemented sandstone matrix. The material is not readily rippable and will require the use of pneumatic tools, hammers and other mechanical breakers for each lift of excavation.
- C. Ground movement in near vicinity of the shoring excavation: Limit lateral movement anywhere within the shoring system and at any stage of construction as measured by observation, surveying and geotechnical instrumentation to the trigger levels as follows:
 1. Vertical Movement – less than ¼ inch for all facilities within 1V:1H gradient measured upward from the limits of the bottom of the excavation; and
 2. Lateral Movement – as specified in Table 1

Table 1 – Trigger Levels for Lateral Movement @ Ground Surface

Facility	Action Level (inch)	Maximum Allowable Level (inch)
Support systems adjacent to buildings, structures, or utilities larger than 36-inch outside diameter within a 1V:1H (vertical to horizontal) gradient measured upward from the limits of the bottom of the excavation	0.25	0.5
Support systems at other locations (see Note 1)	0.5	1.0

Table 1 – Trigger Levels for Lateral Movement @ Ground Surface

Facility	Action Level (inch)	Maximum Allowable Level (inch)
<p>Notes:</p> <ol style="list-style-type: none"> 1. Movement within a horizontal distance of 10 feet from the shaft. 		

- D. Ground Movement along the running length of the tunnel alignment: Refer to Section 02443 for allowable limits.
- E. Monitoring Requirements: Refer to Section 02496.
- F. Allowable water seepage and leakage into the shaft excavation from all sources
 - 1. Excluding seepage of water through shaft break-in and break-out locations for launching and receiving of the microtunnel boring machine (MTBM), total seepage of water into the shaft from all other sources including but not limited to seepage through shaft walls and invert shall not exceed 10 gpm.
 - 2. Seepage from any one square foot of shoring wall shall not exceed 1 gallon per minute.
 - 3. Refer to Section 02443 for groundwater leakage criteria at the shaft break-in and break-out locations for launching and receiving of the MTBM.
 - 4. Total maximum quantity of water discharge from any shaft site – 20 gpm or maximum quantity allowed in the discharge permit issued by the receiving agencies.
 - 5. Prevent surface water runoff from entering excavation by diversion, grading, dikes or other means.
- G. Vibration:
 - 1. Limit peak particle velocity (ppv) for any ground borne vibration at any existing facilities to no more than 2 inches per second.

1.7 SUBMITTALS

- A. Name and qualifications of Excavation Support System installer including prior experience for installing the proposed type of shoring support system in similar ground conditions.
- B. Qualifications of the Professional engineer(s) designing the excavation support systems and the dewatering system(s).
- C. All proposed changes to shaft/pit location, size, configuration or work site boundaries.

D. Submit the following items signed and stamped by the CONTRACTOR's professional engineer(s) meeting the qualifications specified herein:

1. Narrative method statements:

- a. Shoring method(s) and application at the proposed shaft locations.
- b. Means and methods of shoring installation and excavation of material inside the shafts in overburden soils and in the Conglomerate.
- c. Design of the starter wall, break-in and break-out, dewatering system(s), ground treatment, canopy support, details and procedures.
- d. Monitoring program for shaft wall deflection, groundwater leakage and ground movements.
- e. Description of excavation support system removal, backfilling, and sequencing.
- f. CONTRACTOR shall submit drawings and calculations for the work on the pipe and tunnel support system at the SDCWA pipeline crossing, from Station 45+13 to Station 46+00. The submittal shall clearly describe adequate means and methods the CONTRACTOR will implement to protect and monitor the existing Water Authority 108-inch pipeline. Prior to the start of work, the submittal shall be reviewed and approved by the Engineer of Record prior to being sent to San Diego County Water Authority for review. The San Diego County Water Authority will have a 3 week review period.

2. Dimensioned and scaled Working Drawings:

- a. Site plan at each pit/shaft, excavation dimensions, configurations, site grading, and site development details for the excavation and work areas, and the proposed limits of disturbance with considerations of other site constraints, protection of existing facilities, utilities treatment and traffic management details described in the Contract Documents.
- b. Where permanent structures are specified or indicated, show excavation support systems relative to the permanent facilities.
- c. Details for excavation support system, such as shoring, bracing, stabilization, installation tolerances, protection of the excavation, special support requirements for starter wall, thrust blocks, penetrations, mud slab and drainage stone layer, if applicable.
- d. Design and details of the pre-excavation support at the break-in/break-out
- e. Details of shaft arrangement including access, supports, starter wall, entry and exit rings, and water control designs.

- f. Details of types, quantities, and locations of materials and equipment required at each work site.
 - g. Dewatering systems, including general arrangement, depths, procedures to be used, methods of installing dewatering and observation wells, sumps, weep holes, pumping equipment, standby power supply, water treatment system, storage, provisions for sampling, testing and access, and point of discharge.
 - h. All surcharge loads and any restrictions on surcharge capacity, including live loads, shall be clearly shown on the Working Drawings.
 - i. Exact length, type and location of any welding required. Listing only total length of weld required at a particular connection is not acceptable.
 - j. Provide structural connection between all components of the shoring system provided.
3. Design calculations:
- a. Design criteria, loading conditions, design of all structural elements, groundwater controls, global stability analyses, and the design of connections (welds, plates, bolts, etc) and for thrust blocks.
 - b. Calculations demonstrating that the anticipated wall deformations and ground movements are below the Action Levels.
 - c. Design calculations demonstrating the capacity of the thrust block for all phases of the jacking operation, including dimensions, details, mix design, reinforcement, and the soil reaction forces can adequately withstand the applied load.
4. Estimated quantity of infiltration into the excavation, method for measuring inflows, and discharge facilities. Calculations demonstrating the adequacy of the dewatering system(s) in controlling the groundwater seepage. Other submittal on dewatering plan as required by City Supplement (White Book) Section 3-12.8.
5. Detail contingency measures for
- a. Shaft wall instability during tunnel break-in or break-out..
 - b. Unacceptable water inflows through the shaft wall during a tunnel break-in or break-out.
 - c. Wall deformations exceed the values specified herein during excavation of the material inside the shaft. Include remedial steps to be utilized to arrest movement, and reinforce or improve the wall, such that excavation may continue.

E. Materials handling and disposal:

1. Details of materials handling, stockpiling and hauling for excavated materials.
2. Methods and locations of disposal of excavation spoils and wasted slurry. Provide sufficient details to the ENGINEER to evaluate the adequacy and compliance of the CONTRACTOR's methods of disposal with the specifications, including all related environmental permits, and all applicable laws, rules and regulations.
3. Indicate locations of truck cleaning stations and methods of ensuring that haul trucks are clean and that no spillage of dry or wet excavated material from haul trucks occurs on the streets.

1.8 QUALITY ASSURANCE

- A. The CONTRACTOR installing the excavation support systems shall have a record of success with similar projects (i.e. shafts at least 50 ft deep with groundwater at least 20 ft above the shaft invert), and a demonstrated ability and capacity to perform the Work to the satisfaction of the ENGINEER. The microtunneling work will have to be performed by a special MTBM with face access capability and a microtunneling (sub)contractor that has prior working experience.
- B. CONTRACTOR's Engineer: All design work to be performed under this specification shall be prepared, signed and stamped by a Civil or Structural Engineer registered in the State of California who has experience in the design and construction of the same type of excavation support systems and groundwater controls proposed by the CONTRACTOR. The CONTRACTOR's engineer shall maintain involvement and responsibility from design through installation, performance, and abandonment or removal of excavation support and other relevant systems, and shall re-certify the design every 90 days after a site visit until the abandonment or removal of the excavation support systems.
- C. Certification letter from the specialized microtunneling contractor (refer to Section 02443) to confirm that they have reviewed and agreed to the design and construction details of the launching and receiving pits and that any microtunneling related issues have been adequately addressed by the Contractor.
- D. All welding performed in the field shall be done by skilled welders, welding operators, and tackers who have had adequate experience in the method of materials to be used. Welders shall be qualified under the provisions of ANSI/AWS D1.1 not more than 6 months prior to commencing work on the project. Machines and electrodes similar to those used in the WORK shall be used in qualification tests.
- E. Copies of all documentation, MSDS sheets, releases, and permits required herein and necessary to complete the Work.

1.9 PROJECT CONDITIONS

- A. Blasting is not permitted anywhere on this project.
- B. Anticipated subsurface conditions at I-8 crossing are described in the Geotechnical Report and Section 02443 Part 1.6 of the specification. The CONTRACTOR shall evaluate any subsurface information obtained from additional logged holes such as the geotechnical instrumentation borings required by this Contract.
- C. Extreme difficulties were encountered during the exploratory boring program for advancing the drill holes in the Stadium Conglomerate. Refer to relevant information in the Geotechnical Report and plan the work accordingly.
- D. Top of competent bedrock at shaft location shall be assumed at the same depth as indicated in the adjacent borings, i.e. B-10 for launching and B-11 for receiving shaft. The actual depth shall assume to vary within five (5) vertical feet above or below.
- E. The City will collect samples from the Stadium Conglomerate in each of the shaft at the depth of the tunnel horizon for additional analyses. When directed, the Contractor is required to collect and deliver one 55-gallon drum of representative sample of Conglomerate from each shaft site to a designated facility (within a traveling distance no more than 30 miles) to be determined later. Sample taken shall consist of intact clasts without breakage, and use of pneumatic equipment shall be kept to a minimal during the recovery of these samples. The work shall be performed only in the presence of the City representatives. These samples will be used for additional grain size distribution analyses.
- F. Work shall not be performed outside of the work site boundaries shown on the Contract Drawings without the approval of the ENGINEER. Prepare and submit revised traffic management plans for Engineer's approval.

1.10 SAFETY

- A. The CITY has obtained from Cal/OSHA an underground classification for all work described in this Contract. Perform Work in conformance with the underground classification described elsewhere in the Contract Document.
- B. All underground lighting and ventilation equipment shall conform with Class I Division 2 as defined by OSHA Standards, 29 CFR Part 1926, Subpart K, unless more stringent requirements are imposed by Cal/OSHA.
- C. It shall be the CONTRACTOR's responsibility to provide and maintain a safe excavation for all phases of construction. Provide pit/shaft support as necessary to safely accomplish the excavation.

- D. Pre-construction potholing shall be required for any as indicated or as field marked utilities and/or underground facilities when they are located within a 6-ft clearance from the proposed boundary of any underground construction work such as shaft excavation, grouting operation, etc.
- E. In no case shall any excavation be made in such a manner as to endanger or damage adjacent facilities. Material to remain in place shall be adequately supported to prevent undermining of existing facilities adjacent to excavated areas.
- F. The CONTRACTOR shall provide adequate lighting in the shaft and around equipment being utilized.
- G. Provide temporary safety railing, concrete K-Rail barriers, and fencing around shaft excavations.

PART 2 -- PRODUCTS

2.1 MATERIALS

- A. General: Structural steel elements including steel H-piles, bracing, wales, steel ribs, ring beams, anchors and fasteners used for excavation support, whether new or used shall be sound and free from defects.
- B. Structural Steel: Structural steel shall conform to ASTM A36 or better.
- C. Steel liner plates used in circular shaft support shall be 16-inch or 24-inch wide four flange corrugated liner plates. Liner plate material shall conform to ASTM A569 and have yield strength of 28 ksi minimum. Every fourth plate shall have a threaded grout port and threaded cast-iron or steel plug.
- D. Liner plates shall be supplied with neoprene gaskets. Gaskets shall be 1-1/2 inches wide by 1/4 inch thick and shall conform to ASTM D1056 Grade RE45E1 and shall be shop affixed to the liner plate prior to delivery.
- E. Timber lagging shall conform to the following:
 - F. Minimum 4-inch thick
 - G. Moisture content shall not exceed 20%.
 - H. Use sound, well seasoned or kiln-dried timber such as Douglas Fir, Grade No. 2 or better.
 - I. Minimum fiber stress in bending perpendicular to the grain = 1,300 psi.
 - J. Preservative and fire retardant treated wood shall comply with AWPA Standards.
- K. Reinforcing Steel: ASTM A615, Fy = 60 ksi.
- L. Fiber Glass reinforcing bars (for used in starter wall) shall consist of Vinyl Ester Matrix GFRP Rebar with the following properties:
 - M. Minimum fiber glass content – 70 percent per ASTM D2584

- N. Modulus of Elasticity – 5.9 x 10⁶ psi
- O. Barcol Hardness – 60 per ASTM D2583
- P. Minimum Tensile Strength for .625” bar – 95,000 psi
- Q. Minimum Shear Strength for .625” bar – 22,000 psi
- R. Rock Spiling
- S. Rock spiling anchorage system shall consist of 2-inch diameter hollow core center groutable steel pipe lined with a pair of opposite 1/2 inch diameter perforations along the circumference of the steel pipe at every 2-ft spacing. Use double packer system for placement of grout to secure the rock spiling in place.
- T. Rock Dowel:
- U. Rock dowel anchorage system shall consist of 1-inch diameter threaded bar and resin cartridges or No. 8 steel reinforcement bar and cement grout.
- V. Resin Cartridges: Non shrink polyester resin cartridge with a minimum compressive strength of 14,000 psi when tested in accordance with ASTM C39. Resin shall be unaffected by mild acids, mild alkalis or groundwater. They shall be supplied in cartridge forms, and have a casing constructed of a saturated polyester providing resistance to moisture but easily fractured to enable complete mixing during installation.
- W. All cement grout shall conform to ASTM C1107, Grade B: Dry Package Hydraulic Cement Grout (non shrink), and the compressive strength of the grout shall be no less than 9,000 psi at 28 days.
- X. Cement for concrete: Conforming to ASTM C150, Type II Portland cement.
- Y. Controlled Low Strength Material (CLSM) – Per Standard Specifications for Public Works Construction (SSPWC) Section 201-6.
- Z. Welded Wire Fabric shall conform to ASTM A185.
- AA. Weep Hole: 2-inch Schedule 40 PVC pipe with one end opened to the shaft excavation and the other end butted and attached against a filter fabric sheet rest against the excavated rock surface.
- BB. Drainage Rock: In accordance with requirements in SSPWC Table 200-1.4(B), No. 3.
- CC. Shotcrete: In accordance with requirements in SSPWC Section 303-2, with modifications described therein.
- DD. Slurry: In accordance with definition in Section 02443.
- EE. Dewatering Equipment: City Supplement (White Book) Section 7-8.6.6.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Protect, relocate or abandon existing structures, utilities, vegetation and facilities per Contract requirements before commencing pit/shaft construction.
- B. Protect pavements, sidewalks, adjacent structures and other facilities from spillage of excavated material, spoils, slurry, wastewater and concrete.
- C. Protect water quality and prevent or reduce the potential for pollution associated with stormwater runoff into adjacent properties or water drainage system. Develop and implement a water pollution control program per requirements in City Supplement (White Book) Section 1001.
- D. Do not start pit/shaft excavation until installation of geotechnical instrumentation for monitoring movement of the pit/shaft excavation is complete and initial readings have been obtained.
- E. Do not begin pit/shaft excavation and construction until all submittals have been reviewed and accepted by the ENGINEER.
- F. Install excavation support systems in accordance with approved Working Drawings.
- G. If settlement or deflections of supports, excessive groundwater leakage or pit/shaft bottom instability indicates the support system requires modifications, the CONTRACTOR shall immediately take necessary mitigation measures to avoid damaging adjacent facilities or creating an unsafe condition. After the situation is stabilized, the CONTRACTOR shall change the shoring as necessary to prevent further non-compliance performance.
- H. Re-design and resubmit revised working drawings and design calculations for ENGINEER's approval. Any changes made to correct the unacceptable conditions shall be paid for by the CONTRACTOR.
- I. Fireproof materials shall be utilized in all construction of above ground structure within 100-ft of the shaft. The use of flammable materials or wood shoring would require that adequate fire protection be provided.
- J. Minimize overexcavation in overburden soils and in Conglomerate. Over-excavation and backfill beyond the dimensions of the neat line as indicated at each of the shaft shall be included in the bid price.

3.2 CONSTRUCTION METHODS

A. Soldier Piles

1. Soldier piles shall be installed in large diameter pre-drilled holes advanced using a combination of conventional drilling equipment, augering, chiseling, coring, percussion drilling, down the hole (DTH) single and cluster impact hammer methods.
2. Equipment used shall be capable of removing soil and penetrating into the rock formation of the Stadium Conglomerate to the proposed depths without disturbing adjacent or overlying structures. Insert a steel casing together with the advancement of the drilled hole for support against overburden soils and/or unstable layers in the Conglomerate. Maintain any ground vibration to the acceptable criteria as specified.
3. Pre-drilled holes shall be extended the entire length of the soldier piles with a bore hole diameter at least 4 inches larger than the maximum diagonal dimension of the pile sections. A maximum of 1% out of plumb will be allowed provided that minimum excavated neat line is maintained. Correct misaligned or non-vertical piles at no additional cost to the City.
4. Pre-drilled hole shall not be left unsupported anytime during the excavation.
 - a. Add temporary steel casing support; and
 - b. Add slurry or drilling fluid into the holes to enhance stability when excavating below the groundwater table. Maintain the top of slurry a minimum 5 feet above the groundwater level.
5. Lower the steel soldier pile into the pre-drilled hole. Attach to the soldier pile the geotechnical instrument as specified in Section 02496.
6. Backfill pre-drilled hole and encase the soldier pile with Class 2500 concrete up to lowest point of shaft excavation. Fill remainder of hole with 1 sack slurry concrete, completely encasing the soldier pile to the top.
7. Prevent construction water or slurry runoff onto streets, storm drains and adjacent properties. Apply cold tar to seal off gaps and openings in the barrier system.
8. Erect splash guard at top of drilled pile to prevent excavated muck, waste and air borne mist escaping outside the work site boundaries.
9. Dispose of slurry in a safe and environmental acceptable manner and in accordance with permit requirements.

B. Steel Liner Plate Support

1. Liner plates shall be installed in a true circle for circular shaft application in Stadium Conglomerate only, and to be erected just inside the overburden support system. Overburden soils may be supported using soldier pile and lagging system described herein with the bottom of soldier piles to be embedded at least 3-ft into competent Conglomerate formation.
2. Liner plate shall be installed in a manner that will not damage or overstress the lining. Flanges shall be clean and free from material that could interface with proper bearing. Liner plates shall be erected with tight joints. Joints in adjacent rings shall be staggered by one half segment.
3. The liner plate joints shall be bolted together, and attached to steel ribs so that imposed loads will not dislodge them. Maintain the liner plate in true circle by tie rods or other restraints.
4. Carefully perform excavation for installation of liner plate support to minimize formation of voids behind the lagged surface. Overbreak beyond the neat line behind the liner plate shall be backfilled with pea gravel or lean concrete or sand slurry.
5. Stiffener angles welded to liner plate may be required to protect the liner from buckling or damage. The additional reinforcement of the liner plate, if required, shall be provided at no additional cost to the City.
6. Schedule the excavation closely with placement of liner plate support. Do not allow maximum height of unlagged face of excavation to exceed 3-ft in the Stadium Conglomerate. Shorten the vertical height of the unsupported face to no more than 24 inches when unstable ground is encountered. Take suitable measures to stabilize the face and prevent ground displacement. Do not leave any unsupported face overnight.
7. Erect ring beam or rib support on a regular vertical intervals per approved Contractor's design.

3.3 PIT/SHAFT EXCAVATION

- A. Remove the 1 sack concrete backfill from soldier pile bore as excavation progresses to place internal bracing and lagging.
- B. Internal Bracing
 1. Use walers and struts at regular vertical and horizontal spacing per approved Contractor's design to provide internal support of excavation faces retained by soldier piles.

2. Obtain tight bearing between walers and the wall to provide ample bearing area for load transfer and to carry maximum design loads without distortion or buckling.
 3. Include web stiffeners, plates or angles as needed to prevent rotation, crippling or buckling of connections and points of bearing between structural steel members. Allow for eccentricities caused by field fabrication and assembly.
 4. Excavate below point of support as indicated. Install bracing, and preload immediately after installation and before continuing excavation.
 5. Before removing struts, backfill up to three feet below the strut level to be removed.
- C. Install and maintain all bracing support members in intimate contact with other support members and with the ground to allow proper load transfer from the jacking of the microtunneling equipment against the shaft support.
 - D. When design calculations indicate that lateral ground movement will exceed the maximum trigger limits for Action Level listed in Part 1.6, the Contractor shall preload bracing members by jacking struts to 50 percent of the design load if necessary to control shoring movement. Perform the work in accordance with methods, procedures, and sequence as described on the Working Drawings.
 - E. Maintain bottom of the pit/shaft excavation level within 5 feet across the pit/shaft.
 - F. Excavation to the depths proposed on this Project will require implementation of methods to control groundwater at each stage of construction. Prevent groundwater from accumulating and ponding in excavation. Implement measures to control groundwater inflows, in accordance with requirements of the Contract Documents, and to such levels that construction can safely proceed.

3.4 LAGGING

- A. Schedule the excavation closely with placement of lagging. When excavating in overburden soils, lagging placed between soldier piles shall be pushed or driven to the bottom of the excavation to prevent soil from sloughing into the opening. Do not allow maximum height of unlagged face of excavation to exceed 2-ft in the overburden soils and 3-ft in the Stadium Conglomerate. Shorten the vertical height of the unsupported face to no more than 15 inches when unstable ground is encountered. Take suitable measures to stabilize the face and prevent ground displacement.
- B. Do not leave any unlagged face left overnight.
- C. Use lagging secured in place to soldier pile. Install lagging behind the steel flanges as indicated. Provide a minimum 3 inches timber bearing length against the flange. Drive wedges between the lagging and the flanges of the soldier piles creating positive contact between lagging and the soil.
- D. Place prefabricated drainage mat to cover groundwater leakage area, if necessary. Extend the drainage mat connecting to the drainage stones beneath the mud slab at invert.

- E. Carefully perform excavation for installation of lagging to minimize formation of voids behind the lagged surface. Fill the presence of voids with pea gravel or lean concrete.
- F. Maintain a sufficient quantity of material on hand for lagging, bracing and other operation for protection of the work and for use in case of an emergency.
- G. Install alternate shotcrete lagging support in lieu of liner plate system when in Conglomerate. The Work shall be performed per requirements in SSPWC Part 303-2, and the following modifications
 - 1. Use Method B only. Method A is not acceptable for this application.
 - 2. Minimum thickness of the plain shotcrete lining shall be 8 inches or as indicated. If uniformly distributed deformed steel fibers or welded wire fabric as additional reinforcement is used, minimum thickness of the reinforced shotcrete shall be 6 inches.
 - 3. In unstable ground conditions, apply immediately after excavation a 2-inch thick flash coating of shotcrete (flashcrete), following with the 6-inch required reinforced lining by the end of the work shift
 - 4. Install weep holes at the regular pattern as indicated on the excavated rock surface or flashcrete lining of the shaft wall.
 - 5. Minimum compressive strength shall be
 - a At 8 hours 800 psi
 - b. At 72 hours 3,000 psi
 - c. At 28 days 5,000 psi
 - 6. Fiber Reinforcement – 70 lbs per cubic yard steel fiber (Maccaferri FF3 or equivalent).
 - 7. Proceed with the next round of the shaft excavation only after the 800 psi compressive strength has been achieved. Verify the compressive strength using Schmidt hammer.

3.5 GROUNDWATER CONTROLS

- A. Perched Groundwater seepage at Overburden / Stadium Conglomerate Interface
 - 1. Implement the curtain grout wall enclosing the shaft per requirements in Section 02341
 - AND
 - 2. Install a dewatering system as described in Part 1.5.L.1 of this chapter.
- B. Groundwater seepage in Stadium Conglomerate

1. Implement the passive collection and drainage system described in Part 1.5.L.2 of this chapter.
- C. Monitor groundwater discharge from the dewatering system, as well as inflow quantities for total inflow and note increasing or decreasing trends in flow quantities. If seepage exceeds the limit specified in herein, increase dewatering capacities, implement ground improvement, or other approved methods to reduce the inflows to acceptable levels.
- D. The dewatering system shall be implemented and operated per the requirements described in City Supplement (White Book) Section 3-12.8. Dispose all groundwater seepage into the approved receivers or in holding tanks for haulage to offsite disposal.
- E. Finished concrete slab – At shaft bottom
 1. Place a layer of filter fabric against the bedrock subgrade.
 2. Place 6-inch thick mud slab and the 12-inch thick drainage rock layer to the finished invert elevation of the shaft
 3. Install the sump pit as indicated.

3.6 THRUST BLOCK

- A. Place thrust block squarely and perpendicularly to the drive direction of the microtunneling equipment.
- B. Lagging behind the thrust block shall tightly press against the virgin ground. Place contact grout per Section 02441 requirements in bearing area behind the lagging after construction of the thrust block filling the presence of any voids prior to any tunneling operation.

3.7 BREAK-INS AND BREAK-OUTS

- A. Construct concrete starter wall against the face of the shoring system and mount the seal eye against the face of the concrete where the microtunneling equipment will be launched or received. Use fiberglass reinforcement when applicable.
- B. Install pre-excavation support at entrance to break-in and break-out including permeation grout zone and a roof canopy using rock spiling/dowels. Typical distance between spiling/dowels shall be no more than 18 inches. Add spot spiling or dowels as needed to anchor the starter wall firmly in position, especially for the wall in the receiving shaft.
- C. Do not remove the break-in or break-out portions of the shaft until all necessary support is in place.
- D. Before commencing with a shaft break-in or break-out, verify that the surrounding ground outside the shaft wall is stabilized, and the permeability of the ground in the

break-in or break-out is reduced such that water inflows into the shaft through the break-in or break-out are within specified tolerances.

1. Advance two (2) small diameter horizontal probe holes ahead from the starter wall to evaluate stability of the face and to confirm that the ground has been stabilized and the groundwater leakage is acceptable. Refer to Section 02443 Part 1.6.A and Part 3.10 of this specification.
2. Perform strength/leakage/permeability tests as specified in Section 02341 for permeation grouted zone.

Include provisions in the design and construction of the break in and break out so that mitigation measures can be exercised if raveling or running conditions are presented or when leakage exceeds the allowable quantities.

- E. Implement excavation of break-in and break-out in accordance with the requirements of specified herein and Section 02443.

3.8 STOCKPILING EXCAVATED MATERIAL

- A. No stockpiling of excavated material onsite. All excavated muck shall be hauled off site after screening for potential contaminations.
- B. Do not stockpile excavated material adjacent to trenches and other excavations, unless excavation side slopes and excavation support systems are designed, constructed, and maintained for stockpile loads.
- C. Do not stockpile excavated materials near or over existing facilities, adjacent property, or completed Work, if weight of stockpiled material could induce excessive settlement.

3.9 BACKFILL

- A. Install final carrier pipes, risers, closure joints, maintenance hole and other permanent structures as indicated. Perform testing of each pipe joint as required and/or hydrostatic testing of the pipeline. Finish backfilling of the annular gap per Section 02445 requirements.
- B. Upon completion of the work inside shaft but prior to backfilling operation in the shaft, advance at least six 6-inch diameter relief holes through the concrete slab at shaft bottom.
- C. During the backfilling operation, place grout behind any timber or steel lining plate lagging left behind.
- D. Approved backfill materials inside shaft and pit excavation are:
 1. For backfilling portion of pit or shaft around permanent structures or below 8 ft of the final grade:

- a. Concrete Class 480-C-2000 per Table 201-1.1.2(A) of the SSPWC; or
 - b. 1 sack slurry mix with minimum 28-day unconfined compressive strength of 300 psi; or
 - c. Controlled Low Strength Material (CLSM) per SSPWC Section 201.6. Use of cellular concrete is not acceptable.
2. For backfilling portion of pit or shaft between final grade and 8 ft below the final grade:
- a. Use uncontaminated borrow or on site material conforming to the Structure Backfill criteria per the requirements of SSPWC Section 300-3.5.1
 - (1) Within influence area beneath structures, vaults, slabs, pavement, curbs, piping, culverts, duct banks, and other facilities, compact to minimum of 95 percent of maximum dry density at optimum moisture content as determined by ASTM D 1557. Influence area is area within planes sloped downward and outward at 60-degree angle from horizontal measured from 1 foot outside outermost edge at base of foundation or slabs, 1 foot outside outermost edge at surface of roadways or shoulder, or 0.5 foot outside exterior at spring line of pipes or culverts. Backfill placement by jetting is not permitted without approval from the ENGINEER.
 - (2) For the pavement subgrade, compact to a minimum of 95 percent of maximum dry density at optimum moisture content as determined by ASTM D 1557.
 - (3) For other areas, compact to 90 percent of maximum dry density at optimum moisture content as determined by ASTM D 1557.
 - b. Alternatively, use Controlled Low Strength Material (CLSM) per SSPWC 201.6 or cellular concrete at minimum 300 psi compressive strength. Maximum height of each vertical lift of cellular grout backfill shall be no more than 5-ft.
 - c. Allow for thickness of pavement or other surface layer(s).
- E. Restore pavement within streets or parking lot in accordance with the following minimum requirements:
- 1. Prepare subgrade per requirements in SSPWC Section 301.
 - 2. Streets – Same as shown on plans for trench resurfacing and street overlay.
 - 3. Parking Lots – Install Asphalt Concrete(AC) and Crushed Miscellaneous Base (CMB) per SSPWC Section 200-2.4 and City of San Diego Standard SDG-107

3.10 QUALITY CONTROL, TESTS, AND INSPECTIONS

- A. Provide quality control, testing, and inspection as required in the approved shaft and pit design submittals.
- B. If ground movement reaches trigger levels as specified herein and in Section 02443:

- C. Immediately notify the ENGINEER. Develop action plan to correct the deficiencies.
- D. Immediately take steps to control ground movement by revising procedures, providing supplemental bracing or other measures, such as working extended hours or temporarily terminating work in the area of movement, as required.
- E. Install and monitor additional instruments and/or perform additional monitoring as directed by the ENGINEER.
- F. Perform a field investigation program such as SPT drilling to determine the extent of the movement and/or ground loss.
- G. Perform compaction grouting to fill in loss ground area.
- H. The cost of actions required to comply with the trigger levels specified in the Contract Documents and to repair any damage to adjacent facilities shall be borne by the CONTRACTOR.

3.11 UNAUTHORIZED OVER-EXCAVATION

- A. Any over-excavation not authorized by the ENGINEER shall be backfilled to the required grade with the specified material and compaction. The costs of such work shall be borne by the CONTRACTOR.

3.12 REMOVAL OF EXCAVATION SUPPORT SYSTEM

- A. When removing excavation support system, do not disturb or damage adjacent buildings, structures, construction or utility facilities. Fill voids immediately with lean concrete or with approved backfill described herein.
- B. Remove steel or steel reinforced support systems to a minimum 8 ft below final grade in a manner that will maintain support as excavation is backfilled, at no additional cost to the CITY.
- C. Leave in-place deeper excavation support system elements that cannot be removed safely and without causing settlement or damage to the Work or adjacent property. The CONTRACTOR's engineer shall be responsible for determining if excavation support system can be safely removed. Excavation support system elements that are left in place shall be at the CONTRACTOR's expense. Restoration of any damage and the cost of remediating disturbed backfill or adjacent property damage caused by removal of excavation support systems shall be at the CONTRACTOR's expense.
- D. Remove excavation support in manner that does not leave voids in the backfill and does not result in settlement that exceeds response levels.
- E. The support system removed from the excavation shall remain the property of the CONTRACTOR and shall be removed from the site.

*****END OF SECTION*****

SECTION 02341

PERMEATION GROUTING

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section specifies minimum requirements for designing, performing, and testing the adequacy of permeation grouting to be performed for
 - 1. Break-in and breakout of the microtunneling operation at the bottom of the shaft excavation;
 - 2. Formation of a curtain grout wall enclosing the shaft excavation at I-8 crossing; and
 - 3. Other underground crossings where controls of ground stability and groundwater inflow are deemed necessary.
- B. The Work shall be performed to:
 - 1. Minimize groundwater seepage or leakage;
 - 2. Improve the ground stability of in-situ materials;
 - 3. Control ground settlement; and
 - 4. Prevent inadvertent returns of drilling fluid from microtunneling operation.
- C. Perform grouting from grout holes installed horizontally, inclined or vertically to obtain the specified minimum grout coverage as specified and as indicated.

1.2 DEFINITION

- A. Chemical Grout: A combination of ingredients comprising matrix-forming base materials, reactants, and accelerators or retarders.
- B. Grout Curtain Wall: Installation of a series of intersecting and overlapping grout treatment zones to form a continuous impermeable wall or curtain against the movement of groundwater.
- C. Permeation Grouting: A method of ground treatment to reduce permeability and improve strength and stability of permeable, cohesionless layers within the overburden soils and/or Stadium Conglomerate using chemical grout to fill soil pore spaces without causing fracturing or excessive movement of the ground.
- D. Syneresis: Loss of liquid component caused by shrinkage or rearrangement of the structure.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02160. Pit/ Shaft Excavation and Support

- B. Section 02443, Microtunneling
- C. Section 02496, Geotechnical Instrumentation

1.4 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. American Society For Testing and Materials (ASTM):
 1. C494, Specification for Chemical Admixtures for Concrete.
 2. D4219, Unconfined Compressive Strength Index of Chemically Grouted Soils.
 3. D4320, Laboratory Preparation of Chemically Grouted Soil Specimens for Obtaining Design Strength Parameters.

1.5 SUBMITTALS

- A. General: Make in accordance with Greenbook/Whitebook Section 2-5.3.
- B. Product Data:
 1. Materials and equipment specified in Part 2 herein.
 2. Manufacturer's mixing and handling requirements, personal safety equipment, first aid measures, and methods for proper storage and disposal of waste materials, include containers.
 3. Material Safety Data Sheets.
- C. Working Drawings and Methods Statements:
 1. Grout zone dimensions and locations, if different from what indicated or specified elsewhere in the Contract.
 2. Means and methods for grout pipe installation and performing permeation grouting in each application. Identify work and staging areas, patterns, orientations, sequences, depths, utility interference and types of grouting, grout pipes, packers, and methods for performing grouting.
 3. Calculations with clearly stated design parameters and assumptions identifying basis of grout design including computations of grout quantities with respect to porosity, strength of the grouted mass, target volumes, reduction in permeability, and refusal and closure criteria for the ground conditions defined in the Geotechnical Report.
 4. Proposed time schedule and work hours for performing permeation grouting.
 5. Traffic control plans, including sequencing and duration of detours and lane closures, as specified elsewhere in these specifications.
- D. Grout Mix Designs for the subsurface and groundwater conditions anticipated to be encountered.

E. Refusal and closure criteria proposed by the Contractor.

F. Quality Control:

1. Qualifications:

- a. Grouting subcontractor and supervision
- b. Design Engineer.

2. Certifications:

- a. Certified laboratory test results on three sets of three grouted samples at least 30 days before starting grouting operations documenting that the proposed grout mix meets specified requirements.
- b. Manufacturer's certificate of compliance with Part 2, material requirements of this specification section.
- c. Manufacturer's certificate of origin for sodium silicate.

3. Quality Control Plans:

- a. Methods for assuring that the targeted area has been fully grouted and that the strength and/or permeability requirements have been achieved.
- b. Ability to identify the depth to the top of the Stadium Conglomerate within 1 foot accuracy.
- c. Methods for assuring that permeation grouting do not damage utilities or installed geotechnical instrumentation.
- d. Detailed drawings to illustrate preventive measures to protect the utilities and structures from damage.
- e. Methods for determining in-situ testing or sampling for compressive strength.
- f. Spill control plans describing procedures and mitigation measures to prevent and to minimize grout spillage onto ground surface or into the shaft excavation.

4. Records:

- a. Logs of exploratory borings drilled at each grouting location. Results of any field or laboratory testing performed by the Contractor.
- b. Fully dimensioned as-built locations, depths, lengths and orientations of drilled holes and casings.
- c. Daily records of drilling and grouting operations including injection rate, time, location, grout mix, gel time, pressure, rate, volume and packer locations.

- d. Results of the in-situ or laboratory testing of compressive strengths of the grouted materials before and after permeation grouting operation.
5. Notifications:
- a. With 10 days advance notice of performing permeation grouting within public rights-of-way.
 - b. Immediately of leakage or damage to structures or facilities during grouting operations.
 - c. If Contractor's confirmation soil borings suggested a change condition from contract document.
 - d. If any of the contract required grout area is deemed ungroutable.

1.6 QUALITY ASSURANCE

A. Qualifications:

- 1. Design Engineer: California Registered Geotechnical or Civil Engineer.

1.7 DESIGN CRITERIA

- A. The work required herein relies substantially on CONTRACTOR-responsible means and methods for performing permeation grouting. Augment and enhance the minimum design criteria specified herein as required to meet the design and performance requirements specified elsewhere in these specifications.
- B. Confirm subsurface conditions where permeation grouting is indicated or specified by advancing and logging at least one confirmation borehole at each location. Groundwater, when encountered, is reported under an artesian conditions to within a few feet below surface grade. Confirmation boring is not required when an existing or proposed logged, boring are located within 10 feet from the permeation grout zone.
- C. Contract Required Pre-excavation Permeation Grouting
 - 1. Break-in and break-out locations at microtunnel pits and shafts where indicated. The minimum dimensions of the grout zone shall be as shown or as specified; and
 - 2. Continuous grout curtain wall enclosing the launching and receiving shafts to minimize the groundwater inflow at the interface between the overlying soils and the Stadium Conglomerate. The dimensions of the grout curtain wall shall be as indicated.
 - 3. Along the entire length of other underground crossings when groundwater is found at the soils and Stadium Conglomerate interface and within the excavation profile.
- D. Seepage of water through shaft break-in and break-out location for launching and receiving of microtunnel boring machine (MTBM) - As specified in Section 02443.
- E. Perform permeation grouting in areas specified in Part 1.1.A to the following criteria:

1. Hole spacing: 5-ft (maximum; horizontal or vertical spacing)
2. Maximum injection pressure: 100 percent of the minimum vertical or horizontal in-situ stresses;
3. Minimum design criteria based on injection into standard medium-dense Ottawa sand (Ottawa 20-30):
 - a. Unconfined compressive strength: 50 to 100 psi
 - b. Maximum permeability: 1×10^{-5} cm/sec
 - c. Gel time: Between 20 minutes and 50 minutes.

1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Store chemical grouts and other materials to be used for ground treatment according to manufacturer's recommendations and used in order received. Do not use materials beyond expiration date.
- B. Deliver sodium silicate in sealed containers or a certified tank truck, and accompanied by the supplier's certificate of origin. Deliver reactant materials in sealed containers accompanied by the supplier's certificate of origin.
- C. Store chemicals in metal tanks, suitably protected from accidental discharge.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Materials shall be non-toxic, non-corrosive, and non-flammable.
- B. Chemical Grout:
 1. Design mix comprising a liquid base, reactant, water, accelerator, and other approved admixtures as required.
 2. Liquid Base: Sodium silicate with a specific gravity between 1.4 and 1.5, and a silicate-to-soda ratio between 3.20 and 3.35.
 3. Reactant: Organic base type which, when properly mixed with other grout components, provides a permanent, irreversible gel with controllable gel times. The resulting gels shall exhibit less than 15 percent syneresis in 30 days, and not exhibit objectionable odors such as ammonia. Sodium bicarbonate, sodium aluminates and other reactants that produce a temporary grout are prohibited.
 4. Water: Potable and free of impurities affecting grout gelling characteristics and strength development of the grouted soil.
 5. Accelerator: Technical grade, water-soluble calcium chloride or other metal salt, containing a minimum amount of insoluble materials.

6. Grout – Nontoxic and nonflammable during and after grouting.

C. Grout Pipe

1. Provide re-groutable sleeve-port type PVC grout pipes with grout ports at maximum 2 feet centers covered by expandable rubber sleeves

D. Backfill Grout

1. Use bentonite cement grout for backfilling all exploratory holes and PVC grout pipes left in place. The 28-day compressive strength shall be 50 to 100 psi.

2.2 EQUIPMENT

A. Chemical Grouting Equipment:

1. General: Continuous mixing type, capable of supplying, proportioning, mixing and pumping the grout of the type specified. Do not use batch-type systems.

2. Meters:

a. Equip plant with automatic, real-time display, positive displacement meters that accurately measure and record the volume of each component pumped. Locate meters at the injection point and in each material line ahead of mixer.

b. Meter accuracy shall be within 0.25 gpm, independent of fluid viscosity.

3. Pressure Gauge

a. Low maintenance diaphragm seal

b. Analog and digital pressure gauges

c. Unattended automatic monitoring. Provide low power data logger that can read grouting pressure at up to 2 second intervals, wireless interface to a field PC for real time display of grouting parameters including pressures, flow rates and quantities

4. Storage tanks:

a. Of such capacity as to supply sufficient grouting materials to maintain production for at least 1 day so as to not interrupt the work if chemical delivery delays occur.

b. Provide preventive measures against accidental spillage of the grout products into the environment.

5. Mixers and Pumps:

- a. Capable of developing at least 300 psi at pumping rates not to exceed 15 gpm.
 - b. Capable of varying the pumping rate while maintaining constant component ratios.
 - c. Equip with piping or hoses of adequate capacity to carry the base grout and reactant solutions separately to the point of mixing. Combine base grout and reactant solutions using a 'Y' fitting equipped with a check valve and a baffling chamber. Provide a readily accessible sampling valve after the baffling chamber. Equip lines with a water flushing connection or valve placed behind the 'Y' to facilitate flushing the grout from the mixing line and baffle between grouting sessions.
 - d. Equip with an automatic pressure shutoff device to protect against overpressuring in the formation and in the equipment.
- B. Real Time Monitoring Equipment: Provide operators, inspectors and engineers real time display of key grouting parameters such as grouting pressures, pumping rate, flow and grout takes so as to enhance the up to date performance of the grouting operation. The equipment shall provide a permanent record for quality assurance, documented quantities, pressure readings and terminating criteria.
- C. Quality Control Equipment: Provide all equipment and materials required to perform quality control sampling and testing as specified herein.

PART 3 - EXECUTION

3.1 GENERAL

- A. Abandon grout holes that are lost or damaged due to mechanical failure of the equipment, inadequacy of grout supply, or improper injection procedure. Backfill such holes using approved methods and replace.

3.2 PREPARATION

- A. Exploratory Soil Borings:
 - 1. Perform in accordance with Section 02496 Part 3.1.
 - 2. Locate a minimum 5 feet and a maximum of 10 feet outside the excavated width of the MTBM alignment.
 - 3. Backfill all exploratory borings prior to permeation grouting operation.

3.3 DRILLING

- A. Adopt drilling techniques and of sufficient size and capacity to advance the grout pipe installation to the required depth and reach in the Conglomerate. For horizontal grout pipe installation, the borehole shall be cased during installation to prevent cave in.

- B. Orient grout pipes as required to obtain the specified grout coverage between adjacent grout pipes and to avoid obstructions.
- C. After installing grout pipe, encase the sleeve-port grout pipes in a continuous brittle mortar sheath. Use an internal double packer to inject grout at the required sleeve-port for both rock and soil grouting.

3.4 GROUTING

A. Chemical Grouting:

1. Conduct surface pressure test of Sleeve Port Grout Tube (SPGT) from manifold to injection point to determine system pressure loss. The pressure measured shall be used to estimate appropriate grouting pressures for production grouting.
2. Using double packers, inject chemical grout into the selected zones through alternate ports in the sleeve pipes. Temporary high injection pressures not exceeding one minute in duration will be permitted to crack open sleeve-ports.
3. Continue to inject grout until the specified refusal criteria have been met.
4. Repeat steps 2 and 3 for the remaining grout ports in the sleeve pipes.

B. Monitoring:

1. Set up, field test, and verify the accuracy of the automatic grout monitoring equipment.
2. Closely monitor the rate of grout take during grout injection. Ascertain the cause of sudden drops in grout injection pressures following initial start-up pressure adjustments. Continuously monitor adjacent paved and unpaved areas, storm drains and other utilities for grout leakage. In the event that grout leaks are observed, temporarily terminate injection and plug leaks before resuming grouting.
3. If excessive grout take is experienced that is not attributable to leakage, change injection pressure, pumping rates, gel or setting times, or grout composition, subject to the acceptance of the ENGINEER, to reduce grout use to acceptable levels.

3.5 CLEANUP AND SITE RESTORATION

- A. Backfill grout holes immediately upon acceptable completion of grouting at that hole.
- B. Remove grout pipe to a depth of 2 feet below finished grade or surface. Grout pipe below 2 feet threshold shall be backfilled with grout. Restore utilities to the existing conditions.
- C. Horizontal grout pipe can be left in place or to be removed by the MTBM excavation.
- D. Restore street pavement and sidewalks in accordance with SSPWC (**STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION**).

3.6 FIELD QUALITY CONTROL

- A. The CONTRACTOR shall design a field quality control program to demonstrate acceptable improvements in the ground characteristics before and after grouting to determine its effectiveness. The program shall include field or laboratory testing to be performed to verify the presence, strengths and permeability of the grouted soil masses. The Contractor shall perform additional grouting if any of the tested parameters are not in compliance with the performance criteria described herein.
- B. As a minimum, the program shall include the following items:
1. Equipment: Check plant meter(s) accuracy at least twice daily.
 2. Laboratory tests:
 - a. Prepare 3 Ottawa sand samples for each 5,000 gallons of chemical grout pumped and sample in accordance with ASTM D4219.
 - b. Obtain samples of grout used for chemical grouting for gel time checks at the rate of one sample for every half-hour of pumping or for every 500 gallons of grout, whichever is more frequent. Label gel samples and store until the completion of the project.
 3. Field Tests:
 - a. For break-in or breakout - Advance one (1) demonstration boring within the grout zone from each pit or shaft location. Type of tests to be performed
 - (1) Visual: Verify the presence of grout by chemical method. Apply Phenophalin to soil samples recovered by in-situ method at different locations of the grout zone.
 - (2) Strength: Perform continuous SPT (Standard Penetration Test) sampling and testing in the grouted zone. SPT less than 10 bpf shall indicate an insufficient grouting operation.
 - (3) Permeability: Perform a rising or falling head tests in a minimum 3-inch diameter bore hole extended two-third the full thickness of the ground zone to determine the in-situ permeability. For horizontal grout hole, estimate the field permeability by monitoring the groundwater leakage through the borehole opening.
 - b. For grout curtain wall – Advance two (2) demonstration borings inside the grout curtain wall at each shaft location and test for tightness of the enclosure.
 - (1) Leakage Test: Perform a rising head test in a minimum 3-inch diameter cased bore hole advanced 1-ft into the Stadium Conglomerate inside the grout curtain ring and test for rate of groundwater re-charge. Estimated field permeability shall be less than 10^{-4} cm/sec.
 - c. Exact locations of these borings are to be determined by the Engineer in the field.

****END OF SECTION****

SECTION 02441

CONTACT GROUTING

PART 1 -- GENERAL

1.1 SCOPE OF WORK

- A. This section specifies requirements for designing, furnishing, and injecting contact grout for applications as specified and as indicated.

1.2 RELATED SECTIONS

- A. Section 02443 Microtunneling

1.3 REFERENCE CODES AND STANDARDS

- A. Unless otherwise indicated, the current editions of the following specifications and standards apply to the Work of this Section.
- B. American Society for Testing and Materials (ASTM):
 1. C31, Practice for Making and Curing Concrete Test Specimens in the Field
 2. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 3. C109, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2-inch or 50-mm cube specimens)
 4. C144, Specification for Aggregate for Masonry Mortar
 5. C150, Specification for Portland Cement
 6. C937, Standard Specification for Grout Fluidizer for Preplaced Aggregate Concrete

1.4 DEFINITIONS

- A. See Section 02443.

1.5 DESIGN REQUIREMENTS

- A. Water-cement ratio of the grout mix shall be expressed in cubic feet of water per cubic foot of cement (94 pound bag). The water-cement ratio by volume shall be varied as needed to fill the voids outside the jacking pipe. The range of water-cement ratios shall be between 1:1 and 2:1 by volume.
- B. Grout shall consist of Portland cement, not more than 2 percent bentonite by weight of cement, fluidizer as necessary, and water in the proportions specified herein or acceptable to the ENGINEER. Sand may be added to the grout mix in instances of very high grout takes

as approved by the ENGINEER, but in no case shall the grout mix contain less than six sacks of cement per cubic yard of grout. The addition of sand may require the addition of water or fluidizer to the grout mix.

1.6 SUBMITTALS

- A. Work plan shall include contact grouting methods, equipment, procedure, sequence, injection pressure and provisions for each applications:
 - 1. Details of grout mix proportions, admixtures, including manufacturer's literature, and laboratory test data verifying the strength and set time of the proposed grout mix.
 - 2. Design and layout of the contact grout port locations, if different from the lubrication ports. State "the same" if the lubrication and grout ports are the same.
 - 3. Injection pressure calculations denoting maximum injection pressure and factor of safety.
 - 4. Daily logs listing by grout port, volume pumped, maximum pressure, grout mixture proportions, and crew.
 - 5. MSDS for all materials.
 - 6. Notify the ENGINEER at least one working day in advance of starting contact grouting operations.
 - 7. Shop drawing of one-way grout injection or lubrication valve.
 - 8. Grout strength test results within one working day after each test.

1.7 QUALITY ASSURANCE

- A. Make four samples of each proposed grout mix and determine 24-hour, 7-day, and 28-day strengths in accordance with ASTM C39 or C109.
- B. Grout Strength Tests:
 - 1. Prepare and test samples for 24-hour, 7-day, and 28-day compressive strength tests according to ASTM C39 for cylinders or ASTM C109 for cubes, except as otherwise specified herein.
 - 2. Grout samples shall be taken from the nozzle of the grout injection line. Provide at least one set of four (4) samples for each 100 cubic feet of grout injected, but not less than one set from each batch.
 - 3. Grout shall have a minimum unconfined compressive strength of 100 pounds per square inch (psi) in 24 hours, 500 psi in 7 days, and 2,000 psi in 28 days.
- C. CONTRACTOR's engineer shall be a Professional Engineer licensed by the State of California and shall have experience performing similar contact grouting calculations.

- D. Certificate, dated within the last six months, from an independent laboratory that the calibration gauge is accurate to 1 psi.
- E. Volumetric meters shall be calibrated in cubic feet to the nearest 0.1 of a cubic foot.

PART 2 -- PRODUCTS

2.1 MATERIALS

- A. Cement: Cement shall be Type V Portland cement conforming to ASTM C150.
- B. Bentonite: Bentonite shall be a commercially processed powdered bentonite, Wyoming type, such as Imacco-gel, Black Hills, or equal.
- C. Sand: Sand to conform to ASTM C144; except:
 - 1. Fineness modulus: Between 1.5 and 2.0 and
 - 2. The following grading requirements:

Sieve Sizes	Percentage Passing by Weight
No.8	100
No. 16	95 - 100
No. 30	60 - 85
No. 50	20 - 50
No. 100	10 - 30
No. 200	0 - 5

- D. Fluidizer: Fluidizers shall hold the solid constituents of the grout in colloidal suspension, be compatible with the cement and water used in the grouting work, contain an expansive shrinkage compensator, and comply with the requirements of ASTM C937. Submit product literature and data for acceptance, if planned to be used.
- E. Water: Water shall be potable.

2.2 EQUIPMENT

- A. Equipment for mixing and injecting grout shall be adequate to mix and agitate the grout to a uniform consistency and force it into the grout port in a continuous flow at the desired pressure.
- B. The grouting equipment shall be provided with:
 - 1. A volumetric meter at the point of injection.
 - 2. One-way valves.

3. Two pressure gauges shall be provided, one at the grout pump and one at the grout port.
4. Grouting hoses shall have an inside diameter not less than 1.5 inches or greater than 2 inches and capable of withstanding the maximum water and grout pressures to be used with adequate factors of safety.
5. Injection system with a grout re-circulation hose.
6. A pump that provides constant pressure at variable delivery volumes.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Commence contact grouting promptly within 24 hours following completion of the microtunneling drive.
- B. Inject grout through the grout injection or lubrication valves in such a manner as to completely fill all voids outside the steel casing.
- C. Grout pressure shall be monitored, controlled, and recorded so as to avoid damaging the pipe, and to avoid movement of the surrounding ground or improvements.
- D. A hookup shall be made to every grout or lubrication port.
- E. Re-circulate grout mixes when any new mix is batched or after adding water, fluidizer, or sand to mix. Re-circulate mix for sufficient time so grout is consistent with batch prior to pumping grout into grout hole.

3.2 INJECTION OF GROUT

- A. All materials shall be free of lumps when put into the mixer and the grout mix shall be constantly agitated. Grout shall flow unimpeded.
- B. Grout not injected 90 minutes after mixing shall not be used for contact grouting.
- C. Grouting shall progress sequentially in a constant up gradient direction from one grout port to the next grout port in the sequence indicated in the approved submittals.
- D. Contact grouting pressure at the injection point shall not be more than 0.6 psi per foot depth of soil overburden or maximum 15 psi, unless otherwise proposed by the CONTRACTOR, with the ENGINEER's concurrence.
- E. Grouting shall be considered completed when less than 1.0 cubic foot of grout of the accepted mix and consistency can be pumped in 5 minutes under the submitted maximum injection pressure, or grout flows from the shaft or portal at the same rate as it is pump.
- F. Grout lines shall be flushed with water upon the completion of grouting or the end of shift, whichever occurs first. Flushed grout shall not be injected into the annular space.

- G. All ports shall be plugged after grouting has been completed and grout has set.

3.3 FIELD QUALITY CONTROL

- A. Equipment for mixing and injecting grout shall be adequate to mix and agitate the grout to a uniform consistency and force it into the grout port in a continuous flow at the desired pressure.
- B. Grout shall be mixed to a uniform consistency and agitated until used or disposed.
- C. The accuracy of the pressure gauges shall be checked at the start of each shift with an accurately calibrated pressure gauge.
- D. Measure and record contact grout mix proportion, injection pressure and quantities to sufficient accuracy so as to prevent excessively high pressure to cause an inadvertent return or heave.

3.4 CLEAN UP

- A. Clean grout from inside the jacking pipe and remove and properly dispose of all waste grout at the earlier of the end of each shift or the completion of grouting. Check making sure all protrusion into the steel casing shall be removed to avoid interference with the subsequent carrier pipe installation.

* *END OF SECTION* *

**SECTION 02443
MICROTUNNELING**

PART 1 -- GENERAL

1.1 SCOPE OF WORK

- A. This Section specifies minimum design and performance requirements for the construction of the Mid City pipeline at the I-8 crossing by two-pass microtunneling method, where a steel casing pipe will be installed first and the final carrier pipe to be inserted later. This section covers the requirements for microtunneling; whereas additional requirements for the installation of and backfill around the carrier pipe are specified in Section 02445.
- B. Locations, excavation and support requirements for the launching and receiving pits/shafts are specified in Section 02160. Location, dimensions and layout of each pit/shaft are shown on the Drawings are for Contractor information only, and can be modified per Contractor discretion.
- C. Security guard is required at launch pit where Denny's is located. See hours of operation in working hours section and below:
 - 1. Mondays through Fridays
 - a. 11:30am – 1:30pm and 5:00pm – 7:00pm
- D. Conform to latest Caltrans Chapter 600 – Utility Permits, Subtitle 603 “Utility Types and Installation Requirements”; in particularly, Subtitle 603.6A “Trenchless Technologies”; and Subtitle 603.6A-3 “Microtunneling” requirements.
- E. This section of the specification is also applicable if the use of microtunneling method is selected for any other underground crossings.
- F. Delete SSWPC Part 306-8 in its entirety.

1.2 RELATED NON-SSPWC SECTIONS

- A. Section 02441 Contact Grouting
- B. Section 02445 Installation of Carrier Pipe in Steel Casing
- C. Section 02496 Geotechnical Instrumentation

1.3 REFERENCE CODES AND STANDARDS

- A. Unless otherwise indicated, the current editions of the following specifications and standards apply to the Work of this Section.
- B. American Society for Testing and Materials (ASTM):
 - 1. A139, Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over)

2. D2487, Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
 3. D6910, Standard Test Method for Marsh Funnel Viscosity of Clay Construction Slurries
- C. American Petroleum Institute (API): 2B, Specification for the Fabrication of Structural Steel Pipe.
 - D. NSF/American National Standards Institute (ANSI) Standard 60, Drinking Water Treatment Chemicals.
 - E. Occupational Safety and Health Administration (OSHA) Regulations and Standards for Underground Construction: 29 CFR Part 1926
 - F. Cal/OSHA: State of California Administrative Code, Title 8
 - G. "Greenbook", Standard Specifications for Public Works Construction (SSPWC), and per latest revisions by City of San Diego' White Book.
 - H. Caltrans Encroachment Permits, "Guidelines and Specifications for Trenchless Technology Projects" (Please refer to **Appendix J**)
 - I. American Society of Civil Engineers (ASCE) – Standard Design and Construction Guidelines for Microtunneling (Draft), February 24, 2014
 - J. 46 CFR Chapter I, 54.01-17 - Pressure Vessel Human Occupancy (PVHO).
 - K. 29 CFR Chapter XVII, 1926.803 - Compressed Air.
 - L. American Society of Mechanical Engineer, PVHO-1, Safety Standard for Pressure Vessels for Human Occupancy
 - M. American Society of Mechanical Engineer, PVHO-2, Safety Standard for Pressure Vessels for Human Occupancy: In-Service Guidelines for PVHO Acrylic Windows

1.4 DEFINITIONS

A. General:

1. **Annular Space:** The gap calculated by the radial distance between the outside radius of the jacking pipe and the excavated radius of the outermost gauge cutter.
2. **Boulder Volume Ratio (BVR):** Volume of boulders sized (larger than 12-inch in principle dimension) clasts as a percentage of the total muck volume
3. **Carrier Pipe:** The final product pipe for conveyance of water.
4. **Casing Pipe:** A jacking pipe, made of steel, used to support a tunnel and within which the carrier pipe is later constructed. The casing pipe provides initial ground support and transfers the forward thrust of the jacks through the pipe string to the face.

5. Cobbles Volume Ratio (CVR): Volume of cobbles sized (between 3-inch and 12-inch in principle dimension) clasts as a percentage of the total muck volume
6. Compression Ring/Packer: A ring fitted between the end bearing area of the carrier pipe joint to help distribute the jacking forces more uniformly over the entire bearing surface. The compression ring compensates for steering, misalignment, and pipe end irregularities during the jacking process. Compression rings are also referred to as packers. Compression rings are not used with steel casing pipe.
7. Contact Grouting: Grouting outside of the jacking pipe to fill voids and assure that intimate contact for load transfer between the jacking pipe and the native host material has been achieved.
8. Controls: Part of the microtunneling control system that synchronizes excavation, pressure balance, removal of excavated material, and jacking of pipe to balance forward movement with the removal of excavated materials so that ground settlement or heave is minimized or eliminated.
9. Cutterhead: Any rotating tool or system of tools that excavates materials.
10. Cutterhead Opening Ratio (COR): Percentage of open area on the cutterhead in relationship with the total excavated cross sectional area.
11. Earth Pressure Balance Machine: Type of microtunneling or tunneling machine in which the excavated material at the face is controlled to provide the counter balancing earth pressure to minimize or eliminate heave and subsidence. The counter balancing force is typically maintained between the active and passive earth pressures.
12. Emergency Recovery Shaft: A vertical excavation required for the removal of an obstruction or for removal or repair of the trenchless construction equipment. The location of an emergency shaft is determined by construction necessity and will not have permanent civil structures constructed in the shaft.
13. Face: The location where excavation is taking place.
14. Hook up – Connection to a single lubricant or grout port along the jacking pipe.
15. Hyperbaric Intervention – Hyperbaric intervention is to prepare a pressurized atmosphere (with breathable compressed air) at the MTBM excavation chamber where compressed air is used as a mean of ground support, and to allow man entry inside where maintenance tasks can be performed.
16. Inadvertent Return: The loss of drilling fluid, including slurry and lubrication, from the slurry or lubrication system. An inadvertent return occurs with fluids reaching the ground surface, a body of water, or a utility. A common form of inadvertent return, where the fluid reaches the surface or waterway, is commonly called a “Frac-out.”
17. Intermediate Jacking Station(s) (IJS): A fabricated steel cylinder fitted with hydraulic jacks, which is incorporated into a pipeline between two jacked pipe segments. Its function is to provide additional thrust to overcome resistive skin friction of the MTBM and pipeline and to distribute the jacking forces over the pipe string on long drives.

18. Jacking Frame: A structural component, fitted with hydraulic cylinders that is used to push the MTBM and casing pipe into the ground. The jacking frame distributes the thrust load to the casing pipe and the reaction load to the shaft wall or thrust block.
19. Jacking Pipe: A specialty pipe that is engineered and manufactured with a smooth outer wall and watertight joints. The pipe is specifically designed to be jacked through the ground. The jacking pipe is either a casing pipe or a carrier pipe.
20. Jacking/Launching/Entrance Shaft/Pit: A vertical excavation from which trenchless technology equipment and pipe are launched and driven.
21. Jacking Shield: A fabricated steel cylinder from within which tunnel excavation is performed.
22. Laser: A device commonly incorporated into the navigation system used to maintain alignment and grade during tunnel construction.
23. Lubricant (Lubrication): A fluid, normally water with bentonite and/or polymers suitable for the particular ground conditions, used on the exterior of the jacking pipe to fill the annular space to reduce skin friction.
24. Lubrication Port: A port located in a jacking pipe segment, fitted with a one-way valve, for injection of lubrication material into the annular space. After microtunneling installation of the jacking pipe, lubrication ports are used for contact grouting if required.
25. Maximum Allowable Jacking Force: The largest jacking load that the jacking pipe can accept allowing for an appropriate factor of safety.
26. Maximum Anticipated Jacking Force: The largest theoretical jacking force required to advance the pipe string and MTBM from one location to another.
27. Microtunneling: A remote controlled and guided pipe-jacking process that provides balancing of the earth pressure in addition to applying hydrostatic counterbalancing pressure to the face. The pipe string provides continuous support to tunnel.
28. Microtunnel Boring Machine (MTBM): A remote controlled, steerable, instrumentation guided tunnel boring machine consisting of an articulated boring machine shield and a rotating cutter head. Excavated muck is removed by slurry. Personnel entry into the MTBM is not required for the routine operation of the MTBM.
29. "N" Value: Penetration resistance as measured from the standard penetration test (SPT). The SPT consists of counting the number of blows of a 140-pound hammer freely falling 30 inches while driving a 2-inch outside diameter (OD) split-spoon sampler a minimum of 18 inches into the soil. The number of blows is recorded for each 6 inches of penetration for an 18-inch drive. The first 6 inches of penetration are discounted and the number of hammer blows required to drive the sample over the 6 to 18-inch range of sampler penetration is the standard penetration resistance or "N" value. Low "N" value is defined herein with SPT equals 5 or below.
30. Navigation System: System that locates and records the actual, real time position of the MTBM relative to the design location. The navigation system shall be capable to

maintain the line and grade tolerances as specified along the complete jacking distance required.

31. Obstruction: Obstruction is an object not expected to be encountered and located fully or partially in the direct path of the MTBM that meets all requirements specified in this Section, thereby preventing the forward movement of the MTBM after all diligent efforts to advance the MTBM have failed due to one of the following:
 - a. Hard clast (boulder) with a principal dimension greater than 1/3 of the excavated MTBM diameter, or
 - b. More than two (2) minimum 16-inch diameter boulders with an unconfined compressive strength (UCS) greater than 70,000 psi; or
 - c. Hard, cemented sandy matrix with a thickness greater than 2-ft at the face of the MTBM with an unconfined compressive strength (UCS) greater than 16,000 psi or
 - d. Large tree trunk, timber or woods debris in the excavated muck that completely block the MTBM slurry removal system or
 - e. Excavated muck consists of a mixture of gravel, cobbles and boulders debris, with CVR + BVR ratio above the baseline percentage described herein, being collected in the MTBM chamber stalling the rotation of the MTBM cutterhead.
32. Overcut: The radial distance between the excavated perimeter of the outermost gauge cutter and the outside radius of the MTBM.
33. Pipe Jacking: Construction of a pipeline by hydraulically jacking consecutive sections of jacking pipe through the ground behind a shield
34. Pipe String: The succession of joined individual pipes being used to advance the excavation equipment and support the tunnel.
35. Pit: A vertical opening where the depth of the excavation is less than the long dimensions of the excavation. The word "pit" and "shaft" are used interchangeably in this specification.
36. Principal Dimension: The largest of an object's three mutually orthogonal measurements.
37. Receiving/Exit Shaft/Pit: A vertical excavation from which trenchless technology equipment is received and removed.
38. Shaft: A vertical opening where the depth of the excavation is more than the long dimensions of the excavation. The word "pit" and "shaft" are used interchangeably in this specification.
39. Slurry: A water/bentonite/polymer fluid which is used for the transportation of excavated materials and to balance the naturally occurring hydrostatic pressure during microtunneling. Slurry is a fluid designed with specific engineering properties including density, viscosity, and gel strength.

40. Slurry Chamber: An area/chamber located behind the cutter head of a slurry microtunneling machine where excavated material is mixed with slurry in the chamber and transported to the surface by pumping.
41. Slurry Line: A series of hoses or pipes that transports spoils and slurry from the face of a slurry Microtunneling machine to the surface.
42. Slurry Pressure Balance: An operational mode of the microtunneling system which uses a slurry fluid to balance ground and water pressures at the face of the tunnel and improve face stability.
43. Slurry Separation: A process where excavated material is separated from slurry so that the slurry may be reused.
44. Specials: The pipe sections immediately ahead of and behind an IJS that have been specifically manufactured to physically accommodate the IJS.
45. Spoil(s): Excavated material.
46. Sump Pump: A pump placed in a shallow well used to collect and remove water incidental to the construction process, shaft leakage, and to prevent the excavation equipment from flooding.
47. Thrust Block: An engineered structure located between the jacking frame and the shaft wall which distributes the jacking force developed by the hydraulic jacking frame over a large surface area.
48. Thrust Ring: A fabricated ring that is mounted on the face of the jacking frame. It is intended to transfer the jacking load from the jacking frame to the thrust bearing area of the jacking pipe.
49. Trenchless Technology Equipment: Equipment used to install the pipe from the point of origin to the destination without the use of an open trench cut.
50. Trigger Level: Action level or maximum allowable level for movement.
51. Water Jetting: Cleansing mechanism of the cutterhead where high-pressure water is sprayed from nozzles in the cutterhead to help remove soils classified as clays per ASTM D2487

1.5 DESIGN REQUIREMENTS

A. Permits

1. Design the shoring and temporary support systems satisfying all permit conditions.

B. Cal-OSHA Classification

1. The City has obtained from Cal/OSHA an underground classification as “Potential Gassy” for the underground work to be performed under this section:
 - a. All access shaft excavation; and
 - b. All trenchless excavation with an excavated diameter 30 inches or larger.

Refer to Cal-OSHA permit conditions described in Appendix P.

2. All underground equipment shall conform with Class I Division 2 as defined by OSHA Standards, 29 CFR Part 1926, Subpart K, unless more stringent requirements are imposed by Cal/OSHA.

C. Jacking Systems:

1. The installed jacking system capacity, including the use of intermediate jacking stations when applicable, shall exceed the maximum anticipated jacking force by at least 30 percent.
2. Intermediate jacking stations (IJS) shall be designed and capable of withstanding the maximum anticipated jacking force with a minimum factor of safety of 2.0. Fully assembled intermediate jacking stations and two pipe specials for each IJS shall be required and mobilized on site for each microtunneling drive prior to commencing the drive if any one of the following conditions is met:
 - a. When the maximum anticipated jacking force exceeds 80 percent of the maximum allowable jacking force of the jacking pipe.
 - b. When the main jacks do not exceed the maximum anticipated jacking force by at least 30 percent.
 - c. Minimum Requirements
 - i) Provide at least two (2) IJS for the anticipated jacking distance across I-8
 - ii) Stroke distance = 24 inches minimum
 - d. The Intermediate jacking stations shall be collapsible at the end of the jacking operation to allow closure of the casing pipe specials for the formation of the watertight joint.

D. Slurry:

1. The CONTRACTOR shall not use water-soil only as the drilling fluid that relies on natural fines generated during the MTBM excavation to form the slurry. Include use of polymer, bentonite and/or additives to provide a minimum viscosity of 55 second per quart per ASTM D6910.
2. Design the slurry system to facilitate the flow of excavated mucks from the heading to the separation system, to reduce the cutting torque and the wear and tear of the equipment.
3. Design the slurry system to handle the use of polymer and/or bentonite additive in the slurry that is applicable for the ground and groundwater conditions.

E. Lubrication Systems: Lubrication shall be injected continuously and automatically at the tail of the MTBM and at regular spacing along the entire pipe string during the tunneling operation to ensure a complete distribution of lubricant coating the jacking pipe.

1. Lubrication ports shall be installed at a maximum spacing of 10 feet and positioned at 12 o'clock, 4 o'clock, and 8 o'clock along the entire length of the pipe string.

2. Injection pressure and quantity of material to be discharged through each of the lubrication port shall be independently controlled and monitored by the MTBM operator.
3. Lubrication and contact grout ports and plugs shall be designed for
 - a. Maximum injection pressures during construction;
 - b. Maximum groundwater pressure summarized in the Geotechnical Report.
 - c. Maximum operating internal pressure of the carrier pipe at the crossing.

F. Gas Monitoring

1. Perform gas monitoring and testing per Cal-OSHA requirements prior to any man entry activities inside the MTBM tunnel.

G. Entrance and Exit Seals

1. Perform ground treatment at break in and break out zones as indicated and as specified herein.
2. Seals shall be capable of resisting external hydrostatic pressure plus the full pressure exerted by the slurry and lubricant systems of the microtunneling equipment. External hydrostatic pressure shall be based on the design groundwater table indicated in the Geotechnical Report.
3. Use entrance and exit seals that are specially made for the excavated dimensions of the MTBM. Provide adequate adjustments for machine misalignment.
4. Mount exit seal in the receiving shaft only after the Contractor can verify by field measurement the actual position of the incoming MTBM equipment.
5. To control water leakage through the seal assemblies:
 - a. Use inflatable seal.
 - b. Use fast setting grout to stop any remaining leakage
 - c. Use lubricant injection nozzles mounted on the seals

1.6 PROJECT BASELINE CONDITIONS

The tunneling conditions described herein represent the subsurface conditions and ground behavior based on the construction means and methods anticipated. These conditions are established by considering available geologic and geotechnical data, together with past construction experience and anticipated construction methods, interpretation of the data obtained from various sources, including: geologic maps; hollow stem auger, rotary, sonic core and large diameter borings; other borings conducted for nearby projects; geophysical surveys; and in-situ and laboratory tests, as well as the consideration of information from previous construction projects completed locally in similar geologic conditions.

While actual conditions encountered in the field are expected to be within the range of conditions described, the locations where specific ground and groundwater conditions are encountered may vary. The ground behavior will also depend on the construction sequence

and methods employed, as well as the Contractor's equipment, experience and workmanship. The baseline conditions described herein assumes that the construction methods and level of workmanship will be consistent with those that can reasonably be expected from an experienced and qualified contractor.

- A. Tunnel horizon crossing the I-8 freeway is anticipated to encounter the Stadium Conglomerate along its entire length. Confirm the top of conglomerate with additional logged borings to be completed per Section 02496 Part 3.1 requirements.
- B. The Stadium Conglomerate generally consists of yellow-brown, brown and orange brown, massive cobble conglomerate with hard, rounded clasts in a predominantly sandy matrix. The clasts are generally 4 to 6 inches in diameter, with some clasts up to 16 inches in maximum principal dimension. For baseline conditions, the average unconfined compressive strength of the clasts shall be assumed to be 29,000 psi, with 2 isolated 16-inch diameter boulders with compressive strength up to 70,000 psi.
- C. The matrix in between the clasts consists of slightly clayey and/or silty fine to medium sand matrix. There are occasional interbedded lenses of sandstone in the cobble conglomerate. The sandstone interbeds are not laterally continuous and tend to consist of unpredictable, roughly horizon lenses of sandstone. The consistency of the sandy matrix varies from friable (running) to very strongly cemented (with carbonate cement).
- D. The presence of sandstone interbeds and their strength cannot be predicted and are subject to changes vertically and laterally. For baseline conditions, the average unconfined compressive strength of the sandy matrix shall be assumed to vary from 150 psi to 16,000 psi, average 5,000 psi (from testing data available from other projects in the area).
- E. When the conglomerate matrix is very weak, cobble and boulder clasts are not firmly held in place by the matrix and it is expected that the clasts will fall from the tunnel roof, sidewalls and face if not support. The MTBM cutterhead shall be designed with minimum openings and sufficient torque to allow proper breakage of the clasts into smaller pieces at the front of the machine before removal by the slurry system inside the slurry chamber. When the conglomerate matrix is very strong, the MTBM shall be designed with sufficient forward thrust capacity to break up the formation.
- F. For baseline conditions, the Contractor shall assume the following (taken from graduation curves taken on Mid City project and other projects in the area)
 - 1. Principal clast size dimensions and distributions
 - 3" - 6" material - 12% of volume
 - 6" to 12" material - 8% of volume
 - >12" material - 1% of volume
 - Maximum 16"
 - 2. Cobbles and Boulders Volume:
 - Boulder Volume Ratio (BVR) = 1 percent; and
 - Cobbles Volume Ratio (CVR) = 20 percent
- 3. Swell Ratio for Excavated Tunnel Muck - 140 percent of the bank volume

- G. Groundwater is perched in the alluvial soils at the interface with the Stadium Conglomerate which is possibly associated with a previously existing tributary canyon of Alvarado Creek. The perched groundwater elevations are subject to fluctuation due to variations in water infiltration from City of San Diego's Lake Murray water reservoir (immediate to the north of the project site), irrigation, precipitation, leaking pipe, etc. In addition, as reported in the project "Monitoring Well Installation and Groundwater Sampling" report, the static groundwater elevation in Well MW-1 is approximately 3 to 4 feet below the ground surface because of the confined conditions of the aquifer.
- H. From geotechnical studies for other project in the area, groundwater seepage in Stadium Conglomerate is also known to be presented. Based on limited pump test data from other projects, horizontal permeability was determined to be 2×10^{-6} to 2×10^{-5} cm/sec. However, heavy inflows were reported occasionally.

1.7 PERFORMANCE REQUIREMENTS

A. Launching and receiving of MTBM:

1. Stabilize ground so that no more than 3.0 cubic feet of ground enters the shaft at the break-in and break-out locations.
2. Groundwater entering the shaft break-in and break-out locations shall not exceed 5.0 gallons per minute (gpm).
3. Prevent MTBM deviating from acceptable line and grade during launching.
4. Maintain satisfactory performance against ground heaving and/or settlement.

B. MTBM Operation

1. During MTBM operation and shutdown, the face pressure at the heading shall be maintained a minimum of 3 psi above the existing perched or groundwater table and the active earth pressure at the invert of the proposed tunnel.

C. Line and grade:

1. The construction tolerances of the MTBM and the directly jacked casing pipes shall be
 - a. Horizontal Alignment – within 0.025 percent of the total drive distance and not more than 3 inches; and
 - b. Vertical Alignment – within 0.015 percent of the total drive distance and not more than 2 inches.
 - c. No ponding of water or reversed grade shall be permitted between shafts.
2. When the excavation is off line or grade, return to the design line and/or grade over the remaining portion of the drive and at a rate of not more than
 - a. 1 inch per 25 feet
 - b. Maximum allowable angular displacement at the casing and carrier pipe joints.

3. Casing pipe shall be constructed to permit carrier pipe installation in conformance with Section 02445.

- D. Settlement or Heave: Limit settlement or heave to below the Action Levels indicated in Table 1:

Table 1 – Trigger Levels for Settlement or Heave

Facility	Action Level (inch)	Maximum Allowable Level (inch)	Notes
For MPBX bottom sensors (located within 5-ft above the excavated MTBM profile)			
Crossing	0.25	0.5	Applicable to all MPBX(s) located along the MTBM alignment
For MPBX top sensor, Borros anchors, road prisms and other surface or near surface settlement monitoring points			
All Locations	0.1	0.25	<i>Applicable to near surface instruments and all surface mounted surveying markers or scanning</i>
Per Utility Monitoring Plates			
Utilities	0.25	0.5	<i>At all crossings</i>

- E. Groundwater Leakage:

1. Casing Pipe:
 - a. Less than 10 gpm total inflow between launching and receiving shafts; and
 - b. Less than 1 gpm at any isolated or joint locations.
2. Carrier Pipe: No leakage is allowed.

- F. Surveying:

1. Establish control points sufficiently far from any tunneling and construction operation not to be affected by ground movement or damaged.
2. The accuracy of the horizontal coordinates and elevation for each survey point shall be 0.01 foot.

3. Caltrans and/or Cities will perform surface/pavement scanning and/or surveying pre-during and post construction at their discretion. Copies of the pavement survey notes shall be provided to the Contractor upon request.
- G. Tunnel Navigation System:- Use a remotely controlled navigation system designed for an operational distance greater than the drive in which the proposed system will be used with sufficient accuracy to maintain the MTBM drive within the tolerances specified herein.
 - H. Slurry System - Stadium Conglomerate is consisted of high percentages of cobbles and gravel materials. Design the slurry system to successfully stabilize the excavated face by forming "filter cake" and to adequately lubricate, transport and remove the excavated material from the heading to the disposal facilities.
 - I. Lubrication: Monitor the lubricant mix proportion and automatically record the injection pressure and quantities for each hookup to sufficient accuracy so as to completely fill the annular space and to prevent an inadvertent return.
 - J. Access to MTBM cutterhead
 1. Free Air – During the course of the tunneling operation, access to the working chamber behind the cutterhead will be required for inspection, regular maintenance and replacement of cutting tools. Access under free air shall only be performed when groundwater seepage is less than 2 gpm and the excavated face at the heading remains stable and exhibits at least four (4) hours of standup time.
 2. Hyperbaric Intervention – When the ground exhibits excessive groundwater inflows, any type of raveling or running ground conditions, free air entrance shall not be performed. Design, modify, procure, fabricate and implement safe hyperbaric intervention practices per the requirements of the latest Pressure Vessel for Human Occupancy (PVHO-1 or 2), Federal and Cal-OSHA regulations. Hyperbaric intervention shall only be performed by qualified individuals and company only.
 3. Use of emergency shaft excavated from the ground surface for access to the MTBM cutterhead shall not be acceptable.

1.8 QUALITY ASSURANCE

A. Qualifications

1. Microtunneling Contractor: Possess a valid California Contractor's Class "A" license and experience in the installation of pipelines using microtunneling as the method of installation. Experience requirements are the construction and completion of pipeline projects in bedrock, each with a minimum of 800 L.F. of installed pipe minimum 72-inch in finished diameter using microtunneling as the method of installation.
2. Superintendent: The project superintendent shall have tunneling/pipe jacking experience and shall have managed microtunneling projects, each with a minimum drive length of 800 feet, in similar ground conditions with similar equipment.
3. Operator: The microtunneling MTBM operator(s) shall have experience in the installation of pipelines using microtunneling as the method of installation. The MTBM operator shall have successfully completed a pipeline project in bedrock with a

minimum of 800 L.F. of installed 72-inch in finished diameter using microtunneling as the method of installation.

4. Microtunneling engineer shall be a Professional Civil or Structural Engineer licensed in the State of California. Experience shall include performing microtunneling and jacking pipe design calculations.
5. Surveyor shall be a Professional Surveyor licensed in the State of California with experience in underground surveying, including the use of the proposed tunnel navigation system described herein. Other experiences shall include the transfer of points and line from the surface to below ground surface and to perform alignment survey inside tunnels within the last five years for at least three projects.
6. Hyperbaric Intervention Team – Where applicable, company/subcontractor providing hyperbaric intervention support shall have experience in performing compressed air entry activities under similar ground/groundwater conditions to the tunneling construction community. Supervisory personnel and intervention team members to be assigned shall have project experience performing similar tasks to be anticipated on the project. These tasks shall include inspection, replacement of cutting tools, removal of obstructions, machine maintenance and/or repairs performed inside the MTBM working chamber.

B. Caltrans Special Requirements

1. Contractor is responsible to comply with Caltrans submittal requirements and encroachment permit guidelines and specifications. Please refer to **Appendix J**.
2. “Double Permit (DP)” a ground surface/subsurface settlement monitoring plan. The monitoring plan shall be submitted to Caltrans for review.
3. Copies of all "Materials' Certification of Compliance" (Steel Pipe, and other materials utilized within State R/W) shall be provided to the Departments' Representative to be included within the Encroachment Permit File, for the segments installed within State R/W. The “Notice of Materials to be used” (Form CEM-3101), is required listing all materials to be used or placed within State R/W in respect to this project. (i.e., encasement & carrier pipe type, backfill, etc.)

C. Jacking pipe information

1. Jacking pipe capacity calculations shall be stamped and signed by the Microtunneling engineer. Calculations shall indicate the maximum theoretical and allowable capacities.
2. Working drawing showing dimensions of the proposed jacking pipe and IJS specials to calculate jacking capacity and specifically identify the factor of safety.
3. Working drawing showing detail design of the watertight joint of the jacking pipe and the IJS system.
4. Working drawings showing detail designs and layout of the lubrication and contact grout ports, and plugs.

5. Jacking force calculations shall specifically identify source of equation, normal effective stress, sources of friction factor, adhesion factor, use of lubrication, and the factor of safety. Equation and factors shall be from a widely accepted industry source acceptable to the ENGINEER.
 6. CONTRACTOR shall determine the maximum anticipated construction loads, including jacking forces and handling stresses, proposed IJS locations, and ensure that the anticipated loads are implemented in the manufacturer's design of the jacking pipe, subject to the ENGINEER's review.
 7. Manufacturer's written recommendations for repairs for joint failures and side wall failure of the casing pipe to comply with the structural and leakage requirements.
- D. Progress reports: Prepare daily for each work shift and for the microtunneling drive. Each jacking report shall include:
1. Project Name
 2. Date
 3. Printed name of operator and signature.
 4. Number of each pipe installed and length of pipe.
 5. Pipe Stationing
 6. Start and end time for each pipe joint.
 7. Positions of IJS in the installed pipeline.
 8. Start and finish times for each crew each day.
 9. Field testing results of slurry and lubricant
 10. Recorded MTBM data as required herein.
 11. CONTRACTOR's interpretation of the recorded data.
 12. Lubrication log as required herein.
 13. Loss of slurry and./or volume of addition fresh slurry into the system
 14. Obstructions, when encountered.
 15. Gas Monitoring Log (for man entry activities)
 16. Any unusual observations made in the field.
 17. Daily output or printout from the tunnel navigation system and auto data recording (Item E) systems including machine locations, operational parameters monitored, measured, and recorded to demonstrate progress.
 18. Muck volume per jacking pipe and daily total muck quantity
 19. Jacking report (Item E) – weekly
- E. Use an automated data recording system for the microtunneling system supplied. It shall be operated for the duration of the project and the records provided to the ENGINEER in a format acceptable to the ENGINEER. All parameters capable of being recorded by the microtunneling system shall be recorded at a maximum interval of 12 inches of MTBM advancement or every minute during tunneling, whichever comes first. During a stoppage,

jacking force and face or earth pressure shall be recorded at least daily unless otherwise approved by the ENGINEER.

1. Date and time
 2. Stationing, position and deviations of the MTBM in relation to design line and grade.
 3. Pitch, roll, yaw and drift of the MTBM
 4. Maximum jacking force and strokes exerted by each of the main jacks and each IJS.
 5. Position, pressure and jacking forces of each of steering jacks.
 6. Cutterhead torque and RPM of the cutter wheel
 7. Earth pressure measured closest to the face of the MTBM
 8. Inlet and outlet slurry quantities and pressures.
 9. Velocity and volume of slurry per time unit, including percentage of slurry volume bypassed through the system.
 10. Jacking rate and total distance jacked.
 11. Water jetting operating parameters including position of valves, maximum pressure, volume, and operating duration
- F. Provide a separate jacking report prepared by hand to supplement information on the automated data recording system. Jacking report shall include three recording points of measurements for each pipe segment up to and including 10 feet long. The first recording point shall be within one foot of the start, second recording point shall be near the midpoint, and third recording point shall be within one foot of the end. For pipe segments longer than 10 feet add one recording point at the midpoint between the first and second recording points and add one recording point at the midpoint between the second and third recording points for a total of five recording points. For each of the recording points, record the following measurements and provide unit of measure:
- G. Lubrication log shall include date, shift, number of batches mixed, and operator. For every hook up, report the design mix, density, strength, viscosity, pH. Also include location, pipe number, injected volume, duration and injection pressure that were used.
- H. Slurry log shall include date, shift, time and operator. Include on the log design mix, slurry density, viscosity, pH and sand contents. Note on the report the level of slurry in the effluent and influent tanks, estimated fluid loss (via the ground) and quantity of slurry added during the shift.
- I. Contingency plans:
1. The spoils separation plan shall include changes to the separation plant and/or slurry additives upon the request of the Engineer or when testing performed in accordance with the approved submittals or operating parameters indicate the slurry is not performing as intended. Describe methods and procedures for making changes to the separation plant and/or slurry additives.
 2. The MTBM operational plan shall include observational and operational characteristics being monitored that indicate the MTBM is not advancing, experienced excessive ground movement, excessive derivation from contract line and grade, excessive "spikes" in cutterhead torque and jacking thrusts, in low blow count material, presence

of elevated hazardous gas levels, excessive groundwater leakage and other non-compliance performances. The plan shall include an explanation of the probable causes. The plan shall also include replacing operators, advance rates, changes in the slurry mixes, pressures and other modifications to be made on the MTBM equipment and work procedure to be implemented in the field.

3. The obstruction removal plan shall include observational and operational characteristics that indicate the MTBM is not advancing due to an obstruction. The plan shall include the confirmation of the obstruction and methods to remove the obstruction considering face access, groundwater control, ground support methods, type of obstruction, location of stoppage, and impact to traffic and adjacent facilities. The plan shall also include procedures to abandon the tunnel should it become necessary, and shall include machine and pipe retrieval/pull back when appropriate, and backfilling of the abandoned opening with grout during the machine retrieval process.
4. The hyperbaric intervention plan shall include planning, setup and execution phases, as follows.
 - a. Planning Phase - preparation, documentation, submittal, approval, notification, as well as coordination with Cal-OSHA and other agencies having jurisdiction for the development of an Intervention Work Plan including the equipment and staffing needs, if and when hyperbaric activities are required. The Planning Phase shall also include the decision process to determine when and where intervention is necessary. Planning Phase shall be completed within 90 days after NTP.
 - b. Setup Phase - setup the supervision, equipment, personnel, training that will be required for successful completion of the activities. Medical support team and facilities shall also be identified and under contract to provide emergency service when necessary. Demonstrate to the City what necessary administrative and management steps need to be taken to allow the intervention work to be performed within the schedule as proposed and specified herein. Setup Phase shall be completed 20 work days prior to the microtunneling activities.
 - c. Executive Phase - Identify of the immediate scope of work for the hyperbaric intervention activity. Develop detail work procedures and sequencing to address and correct the problems. Develop a detail time schedule for the 1st time and subsequent times when hyperbaric interventions are needed. Executive Phase shall be completed within 5 work days for the 1st intervention activity and within 72 hours for all subsequent activities.
5. The tunnel navigation plan shall include operational parameters observed, measured, and recorded to determine if the equipment has moved or distortion is affecting the guidance. If any reach of the installed jacking pipe is off line and/or grade, the plan shall include a return to the design line and/or grade as specified herein.
6. The jacking plan shall include operational parameters observed, measured, and recorded to determine if jacking force is increasing at a rate that would exceed jacking capacity or jacking force increase at a rate causing reasonable concern for completing the drive. Include actions and procedures to address situations when jacking force is

increasing at a rate that would exceed jacking capacity or when mining is resumed after a long delay or stoppage.

7. Ground improvement plans when required at launching shaft and/or behind thrust blocks/reaction wall due to weak and unstable soil conditions.
8. The inadvertent return plan shall include cleanup methods on the ground surface, emergency telephone numbers, sources of equipment and materials needed for containment and clean-up, and corrective actions for reducing operating pressures and modifying the slurry or lubricant. The plan shall include replacement of personnel when necessary and acceptable to the ENGINEER. Slurry and lubrication inadvertent return plan shall include operating parameters that are controlled with the intent of preventing an inadvertent return. Inadvertent return plan shall include a minimum shutdown period. The restart of mining will be permitted only after the satisfactory execution and completion of the procedures described in the approved contingency plan, and approvals from all agencies having jurisdiction have been obtained.
9. The jacking pipe failure plan shall include inspection, repair, and removal plans. Repair and recovery methods shall be acceptable to pipe manufacturer, the ENGINEER and Caltrans.
10. A remedial plan when groundwater leakage observed inside the casing pipe or direct jacked carrier pipe exceeds allowable limits.
11. An action plan to be prepared and pre-approved before all tunneling operation and it shall be mobilized immediately when excessive settlement (above trigger levels described in Part 1.7.D) is encountered. The plan shall incorporate all corrective measures included in Part 3.6.C making sure roadway safety is not compromised. Such plan shall describe means and methods of the proposed operation, equipment to be employed, name and contact information of subcontractors that may be required to perform these corrective measures, A preliminary traffic management shall also be included.

1.9 SUBMITTALS

A. CONTRACTOR's qualifications and experience records as required herein:

1. Microtunneling Contractor, project superintendent(s) and MTBM operator(s)
2. Microtunneling engineer
3. Surveyor
4. Hyperbaric Intervention Team, including the mechanical engineer designing the interventional equipment.

B. A copy of all required permits.

C. Microtunneling Machine

1. Shop drawings of microtunnel machine, including dimensions, design and configuration of cutter head, tooling, overcut, provisions for face access to the MTBM cutterhead and other machine features to comply with the requirements described in this Section. Indicate the unconfined compressive strength and the diameter of the largest spherical object that can pass through the cutter wheel and be crushed by the MTBM.

2. Preprinted machine specifications or a letter from the microtunneling machine manufacturer(s), in English, demonstrating that the selected machine(s) satisfies all aspects of the requirements in this specification and is capable of progressing through the anticipated soil/rock conditions as indicated in the Geotechnical Report for the proposed jacking diameter and distance, and to support all aspects of the proposed contingency plans.
- D. Demonstrate that the proposed construction means and methods meet specified requirements:
1. A general description and schedule of the microtunneling procedure, including shaft/pit construction pertaining to microtunneling operation, equipment set-up, breakin/breakout treatment, MTBM excavation, work sequencing and schedule, method, spoil removal, spoil disposal, methods of protection and maintenance of project site, and groundwater control methods.
 2. Written recommendations from machine manufacturer(s) with the proper operational procedures for balancing the hydrostatic and earth pressures so as to minimize ground movement and prevent inadvertent return of slurry.
 3. Written recommendations with the proper operational procedures for safe performing the hyperbaric intervention.
- E. Working Drawings/Work Plan:
1. Layout, access and dimensions of work site, depth and dimensions of launching and receiving shafts; including jacking equipment within the pit/shaft and aboveground equipment at each location. Provide a separate drawing superimposing permanent civil works within the pit/shaft.
 2. Design and schedule of installation of electrical system, lighting system, onsite power generation or electrical hookup.
 3. Grade and alignment controls, and design of the navigation system including operating parameters, monitoring recording and QA/QC requirements. Manufacturer's specifications, manuals, and any drawings of the navigation system.
 4. Method used to check the line and grade of the excavated tunnel per Field Quality Control requirements.
 5. Methods for launch and retrieval of the MTBM including any modifications to the shaft. Additionally, describe procedures that will be used to confirm entry and exit portals are stable, prior to launch and retrieval of the MTBM.
 6. Watertight MTBM entrance and exit seals. Provide design calculations, drawings, and descriptions including the maximum pressure the seals are capable of resisting to demonstrate that the seal assembly will satisfy the requirements specified herein.
 7. Estimated daily volume of muck generated and means and methods for field measurement and verification.

8. MTBM retrieval or pull back system for a distance up to 300 feet from the launching shaft, including recovery of all installed pipe. Allow backfill grout/slurry to be discharged through MTBM cutterhead to fill in the abandoned tunnel during the pullback of the MTBM equipment.
 9. Air Lock, man lock or air pressurized vessel or bulkhead. - These systems shall be designed by a registered mechanical engineer. Certification of compliance with the PVHO standard will also be required,
- F. Contingency plans - described in Part 1.8.
- G. Slurry System:
1. Slurry system of the microtunneling machine, including a line diagram illustrating the operation, monitoring and controlling of the slurry system in applying hydrostatic counterbalancing pressure to the face.
 2. Slurry management plan to avoid inadvertent return and spillage onto street surface.
 3. Details of slurry system and soil separation methods. Include calculations of the system capacity, flow rates to handle sizes and quantity of the material anticipated. Demonstrate that the slurry system has sufficient pressure, velocity and volume to adequately transport and remove the excavated mucks as intended. Include pressure gauge and volumetric gauge locations.
 4. Design mixes, additives and materials to be used for slurry to perform its intended functions in the subsurface conditions described in the Geotechnical Report. Include a targeted range of properties for each soil type, testing methods and requirements to ensure that the slurry is within the proposed targeted properties and performing as intended. Targeted properties of slurry shall include measurements of the pH, unit weight, solid contents (percent of particular larger than No. 200 sieve) and viscosity.
 5. Demonstrate that the slurry system has sufficient pressure and volume for slurry to perform as intended and prevent inadvertent returns. Include pressure gauge and volumetric gauge locations.
 6. Design of the slurry separation system including various components, and selection of screen sizes, scalper shaker, hydro cyclones and centrifuge for water based slurry with and without additives.
- H. Jacking system details, and numbers of intermediate jacking stations required and their proposed spacing, method of operation, thrust capacity, and sleeve details, plus method of control to prevent the maximum allowable jacking force from being exceeded.
- I. Auto Lubrication System: Description of lubrication mix equipment, control system and procedure for lubricating the pipe during jacking operations, including estimated injection volume at each port for the anticipated soils. Submit materials to be used for lubrication, with consideration of the groundwater conditions anticipated to be encountered along the alignment.
1. Location and pattern of lubrication ports along the MTBM and the jacking pipes.

2. Mix designs including grout mix, proportions, density, slump, strength, viscosity, and pH.
 3. Demonstrate that the lubrication delivery system, including design calculations, shall have sufficient capacity, pressure and volume for lubrication to perform as intended.
 4. Estimated quantity of lubrication needed to fill in the annular gap for the soil conditions at each port.
 5. Injection and monitoring systems to allow independent control of the grout flow rate, volume and pressure at each port, including pressure gauge and volumetric gauge locations.
 6. Sample lubrication log sheet acceptable to ENGINEER.
- J. Jacking pipe information as required herein. Including manufacturer's certificate of compliance that the jacking pipe complies with project specifications.
- K. Power generation plant and slurry plant sound rating data. Sound level rating data shall be based on actual tests of an identical unit or a similarly packaged unit of equal capacity with calculated corrections submitted for review. Manufacturer's test procedure, equipment, and reporting shall conform to SAEJ1074, Engine Sound Level Measurement Procedure or ANSI/ASME PTC36, measurement of industrial sound.
- L. Provide a sample copy of all reports to be filed under this work including information available from automated data recording of the performance of the lubrication system, sampling frequency, and available formats for the ENGINEER to select.
- M. Notification:
- a. Provide minimum five work days advance notification of meeting date and time for any preconstruction meeting.
 - b. Notification requirements during construction as specified herein.
- N. Survey plans including the following:
1. Records of the line and grade alignment information during the MTBM operation summarized using the Tunnel navigation system in a format acceptable to the Engineer. Submit the as recorded alignment information on a weekly basis.
 2. As-built drawings of the jacking pipe showing the horizontal coordinates and elevations, and deviations from the design line and grade of all pipe joints. Clearly indicate any out-of-tolerance locations on the as-built drawings. Submit cross sectional drawings also to highlight the clearance envelope between the casing pipe and the permanent product pipe.
 3. Surface and/or subsurface settlement records as reported by the geotechnical instrumentations, results of the surveying and/or scanning.. The plan shall incorporate survey plans/notes performed by Caltrans and/or Cities.

- O. Job Hazards Analyses: Submit Injury and Illness Prevention Program for information only to demonstrate compliance with the law. The plan shall identify the potential hazards including chemical hazards to the work crew, the environment, and the surrounding communities. Include all the mitigation measures necessary to address these hazards. The plan shall also address all the safety issues that may be required for the work described in the contingency plans.
- P. Disposal Plan – Include disposal plan(s) for excavated spoils and wastewater generated during the microtunneling operation.

PART 2 -- PRODUCTS

2.1 MATERIALS

- A. Jacking pipe and joint shall be able to withstand the installation loads without cracking, breaking or suffering other damages.
- B. Steel Casing pipe:

When steel casing pipe is specified

1. Casing pipe shall be at a minimum ASTM A283, Grade C or ASTM A36 steel and shall comply with requirements in SSPWC 207-24.
2. Casing pipe shall be a direct-jacked, non-pressure welded steel pipe, with “Permalok” joints specifically designed for pipe jacking.
3. The steel casing pipe shall have
 - a. A minimum wall thickness of 1 inch.
 - b. Joint designed to withstand the anticipated groundwater hydrostatic pressure, slurry and lubricant injection pressures;
 - c. Dimensional tolerances shall be as follows:
 - i) Outside Diameter – within 0.1%
 - ii) Exterior Roundness – Within 0.5%
 - iii) End Squareness Ratio – Within 1/8 inch
 - iv) Straightness – within 1/8 inch
4. Inside diameter of the steel casing pipe is assumed to be 82-inch but shall be finalized by the Contractor so as to provide the minimum clearance required all around the outside diameter of the final carrier pipe and fiber optic conduit(s), and to account for any installation misalignment during casing pipe advancement. The CONTRACTOR may select a greater pipe diameter or thickness for the method of work, loading characteristics, site conditions, or possible interferences; and shall be fully responsible for the sufficiency of the casing provided.

5. See Part 2 of Section 02445 for additional requirements.
- C. Slurry and lubrication shall consist of high yielding sodium montmorillonite bentonite and polymers, additives, and water.
1. Water shall be furnished by the CONTRACTOR from a potable water source.
 2. Specially designed for the groundwater qualities described in the Geotechnical report.
 3. All water shall be tested for pH and treated with soda ash, or approved equal, to adjust the pH of the water as required in the accepted mix design(s).
 4. Bentonite, polymers, and additives, other than soda ash and salt water additives, shall be NSF/ANSI Standard 60 Certified or equal for clean water testing. Additives shall not contain any hydrocarbons.
- D. Cement:
1. Conform to the requirements of ASTM C 150.
 2. Type II or V.
 3. Water shall be furnished by the CONTRACTOR from a potable water source.

2.2 EQUIPMENT

A. MTBMs and components.

1. General:
 - a. The microtunneling system shall be specifically designed for tunneling in geotechnical conditions stated in the Geotechnical Report, and allows the tunnel to be constructed without delay to the schedule of this project.
2. MTBMs: Approved MTBMs shall also satisfy the following requirements:
 - a. Maintain the stability of the tunnel face;
 - b. Mixed face cutterhead design for mining the variable ground conditions;
 - c. Equip with sufficient power and ability in normal operation to cut, fracture or crush hard material of sizes up to 1/3 excavated MTBM diameter and maximum 25,000 psi in compressive strength.
 - d. Prevent loss of ground through the machine during shutdowns.
 - e. Measure and provide pressure balancing support by the application of counterbalanced slurry pressure at the excavated face;
 - f. Variable cutterhead rotational speed tailored to variable ground conditions.

- g. Rugged and well armored cutterhead to resist abrasion. Use retractable cutterhead to allow MTBM to "un-jam" itself when stuck.
 - h. Equip with recessed, protected and backloaded cutting tools.
 - i. Limit the COR ratio to 20 percent or less to control the rate of excavation and flow of excavated muck through the cutterhead into the slurry chamber reducing overexcavation, the cutting torque and risk of stalling.
 - j. Process sufficient torque in the cutterhead to remove material excavated or fallen from the face of the heading. Minimum torque required will be 350,000 ft-lb.
 - k. Include the use of a rock crusher breaking down gravel to cobbles sized material into smaller components (less than 3 inches) to be removed by the slurry system.
 - l. Provide access under both free air and under elevated atmospheric pressure to the cutterhead slurry chamber for maintenance, inspection, replacement of cutting tools and removal of obstructions.
 - m. Articulation to allow steering and line and grade corrections
 - n. Position the 1st intermediate jacking station within 100-ft from the tunnel heading.
 - o. Incorporate water tight seals between the MTBM, all trailing cans, and leading pipe.
 - p. Protect electric and hydraulic motors and operating controls against water damage.
 - q. Use bi-directional drive on the cutter head wheel, and/or adjustable fins or other means, to control roll.
 - r. Minimum annular space shall be 1 inch, unless indicated by the CONTRACTOR in the submittals and approved by the ENGINEER.
 - s. Capable of tunneling through ground improvement zones specified in the Contract Documents and at the break-in and break-out locations.
3. Cutting Tools shall include:
- a. Wear resistant scrapper; and
 - b. Multi-roller disc cutter designed for use in excavating rock and boulders up to compressive strength of 25,000 psi.
4. Slurry System: MTBM shall include an automated spoil transportation slurry system that balances the naturally occurring hydrostatic pressures by the use of a slurry pressure balance system. System shall be capable of adjustment required to maintain face stability. Slurry system shall:
- a. Balance, manage and control the pressure at the face by use of the slurry pumps, pressure control gauges, valves, and flow meters.

- b. Include a slurry bypass unit in the system to allow the direction of flow to be changed and isolated, as necessary;
- c. Provide an upstream pressure gauge as close to the face as possible to provide real time reading and monitoring of the face pressure during operation and shut down
- d. Generate sufficient flow capacity, pressure and velocity in the slurry system to properly transport the mucks to the ground surface treatment facilities.

B. Slurry Separation Equipment shall:

1. Adequately separate the spoil from slurry so that slurry within the operating parameters can be returned to the cutting face for reuse. Use separation plant, including scalping screens, shaker screens, de-sanding and de-silting cones, and centrifuge as necessary for the conditions indicated in the Geotechnical report.
2. Use the type of separation process suited to the size and rate of excavation, the soil type and sizes being excavated, anticipated solid and fine contents in the slurry mix, and the workspace available at each launching pit/shaft.
3. Monitor the composition of the slurry to maintain the pH, slurry weight and viscosity limits defined by the operating parameters.
4. Protect against any slurry spillage and contain separated spoils in covered containers for removal from the site.

C. Pipe Jacking Equipment shall:

1. Jacking capacity to push the MTBM and the pipe string between the pit/shaft locations identified on the Working Drawings.
2. Impose sufficient thrust loads onto the cutting tools to fracture, crush and break up the rock formation and boulders encountered.
3. Hydraulic cylinder extension rates synchronized with the excavation rate of the MTBM.
4. Uniform distribution of jacking forces on the bearing end of the jacking pipe.

D. Remote Control System shall:

1. Allow for operation of the MTBM without the routine needs for personnel to enter the tunnel.
2. Display available to the operator, showing the position of the shield in relation to a design reference together with roll, pitch, complete navigation system, valve positions, thrust force, cutter head torque, rate of advance, installed length and slurry operating parameters.
3. Integrates the system of excavation and removal of spoil and its simultaneous replacement by pipe. As each pipe section is jacked forward, the control system synchronizes all of the operational functions of the system.

- E. Alignment Control shall:
 - 1. Include a computerized guidance system capable of accurately steering, tracking, and continuously recording machine location and permitting continuous control and setting of alignment and grade per allowance tolerance. Provide real time navigation data including location check and record electronically the actual position of the machine for QA/QC confirmation by the City.
 - 2. Control line and grade per allowable tolerances.
 - 3. Provide steering information when applicable.
- F. Lubrication System: System shall include pressure gauge, volumetric gauge, and shut-off valve on the pump or at the point of injection; and control and monitoring systems for the use of the operator. The lubrication stem shall be such that it can automatically be controlled from the operators cabin and controlled volumes of lubricant can be injected by the MTBM operator at selected locations along the tunnel, if necessary. Such volumes of lubricant pumped, including the location of injection, shall also be automatically recorded.
- G. Launch and exit seal – Include single or double rubber donut gaskets mounted to the shaft wall, with slide plates to prevent inversion.
- H. Air Lock: Integrates into the design and construction of the MTBM Type A equipment an air lock, man lock, air pressure vessel or special bulkhead for performing hyperbaric intervention. All auxiliary equipment shall also be included.

PART 3 -- EXECUTION

3.1 GENERAL

- A. The MTBM shall not be launched until the receiving pit or shaft is completed and ready to receive the MTBM equipment.
- B. Complete the ground improvement at the MTBM break-in and break-out as indicated per requirements of the Contract Documents. Allow sufficient set time for grout to set prior to excavation work.
- C. The Contractor shall contact Caltrans' District 11 Field Survey Supervisor, Ned Salman, phone number (858) 467-4305 or by email at ned.salman@dot.ca.gov, at least a month in advance of beginning the tunneling operation, to arrange for Caltrans to conduct an initial survey scan of the pavement surface. Notify the City all Contractor's correspondences with Caltrans.

3.2 WORK AREA PREPARATION AND MAINTENANCE

- A. Organize of microtunneling surface equipment for the drive in such a manner as to enable proper operation at all times, to minimize impacts to property owners, to minimize inadvertent return and spillage, and to maintain traffic control patterns as specified.

- B. Any equipment operating with fuel, hydraulic, or lubrication oils shall be provided with suitable containment basins made of plastic lining and sand bags to ensure no loss of fluid to drains or water courses or to contaminate the ground.
- C. All equipment shall be maintained and kept in working order. All oil, hydraulic, or fuel leaks shall be repaired upon discovery. Any leaking equipment shall not be used until repaired.
- D. All lubricant, slurry, or materials leaked or spilled shall be contained, cleaned up, and disposed of properly.
- E. Remove excavated muck from work site during each working day to allow an accurate count of daily muck volume.

3.3 INSTALLATION

A. General

1. If allowable tolerances are exceeded or if the MTBM equipment failed to complete the drive not because of the presence of any obstructions or changed conditions, the CONTRACTOR shall pay all costs for correction, re-install, redesign, reconstruction, and re-inspection. If redesign is required, the CONTRACTOR shall obtain the services of a Professional Engineer registered in the State of California for the redesign.
2. Adjust the quality of the slurry by adding additives or by additional cleaning to satisfy the intended functions for stabilizing the face and for removing excavated spoils from the heading.
3. Inject lubricant continuously and at regular hookup interval to reduce the jacking forces. Provide and/or weld permanent pressure plug sealing lubricant port when no longer in use.
4. Measure the total groundwater inflow during the MTBM operation. Provide written notice within one working day of discovery and repair leakage prior to acceptance.

B. Alignment Establishment:

1. CONTRACTOR's surveyor shall check baseline and benchmarks provided by the CITY before commencing excavation and immediately report any errors or discrepancies to the ENGINEER.
2. Use the baseline and benchmarks provided by the CITY's surveyor to furnish and maintain additional reference control points, lines and grades for the pipeline construction.
3. Check the primary control for the microtunneling system against an undisturbed above ground reference at least once each week

C. Obstructions during Microtunneling:

1. Obstruction removal shall be performed by face access under free air or hyperbaric intervention, or by MTBM retrieval and tunnel abandonment. Sinking an emergency shaft for removing the obstruction will not be acceptable.

2. Obstructions as defined in this specification will be made in accordance with the Contract only if all the following requirements are met by the CONTRACTOR:
 - a. Satisfy the definitions of an obstruction described in Part 1.4;
 - b. Beyond the excavation capabilities of the MTBM equipment described in Part 2.2.A.
 - c. Notify the ENGINEER in writing immediately upon encountering a suspected obstruction that stops forward progress. Perform an inspection at the heading and document the findings.
 - d. Upon written authorization by the ENGINEER, proceed with removal of the suspected obstruction by means of approved removal procedure.
 - e. When appropriate, collect representative samples of the obstruction for additional analyses to be performed by the Engineer.
 3. The proposal of alternative methods for removing, clearing or otherwise making it possible for the microtunneling equipment to progress past a suspected obstruction that does not allow for the direct observation, documentation, measurement of the object or recovery of samples for grain size distribution, compressive strength testing shall not be considered for additional payment.
 4. No additional compensation for removing, clearing, or otherwise making it possible for the microtunneling equipment to progress past an object that is not an obstruction shall be paid.
 5. No additional compensation for replacement of worn cutter, making repairs to cutting tools or otherwise performing routine maintenance work, to achieve better performance of the microtunneling equipment so as to progress past an object that is not an obstruction shall be paid.
 6. There shall be no additional compensation for damaged pipe or removal of damaged pipe when obstructions are not present.
- D. CONTRACTOR shall not employ water jetting without a written request and the ENGINEER's written approval. Water jetting will only be authorized in soils classified as clays per ASTM D2487.

3.4 HYPERBARIC INTERVENTION

- A. When hyperbaric intervention is deemed necessary for face access to replace cutting tools, to perform inspection, investigation, maintenance and repair, and to remove obstructions, the Contractor shall submit the request for City approval, including the in-situ ground and groundwater conditions, MTBM operational and performance data to justify the needs of such intervention activities.
- B. All intervention work to the MTBM working chamber shall commence within 5 work days for 1st intervention and 72 hrs for subsequent interventions once approved by the City.

- C. Any equipment necessary for intervention that cannot be mobilized within the 72-hr duration shall be designed, procured, fabricated, mobilize and installed ahead of time during the mobilization phase of the microtunneling work.
- D. Use of leased or rental hyperbaric equipment is acceptable as long as they are in full compliance of the hyperbaric intervention requirements as stated herein, Contractor's proposed methods and the required schedule.
- E. Company/Subcontractor and personnel on the intervention team shall also be properly trained and on standby, ready to be deployed within the required schedule.
- F. PAYMENT for Work in this Section shall be included as part of the Allowance for which such work is appurtenant.

1. Setup for Hyperbaric Intervention (Allowance)

- a. This Allowance price item shall compensate the Contractor the design, procure, fabricate, assemble, erect, install the additional equipment and setup required for the performance of a hyperbaric intervention to the slurry chamber of the MTBM. The setup shall be completed within 5 working days as described in Section 02443. Any additional setup time necessary shall be paid for by the Contractor.
- b. Equipment standby time and cost during the preparation for hyperbaric intervention shall also be included.
- c. The City will pay this setup cost one time only, even though multiple hyperbaric intervention exercises are carried out during the full duration of the Contract.

2. Perform Hyperbaric Intervention (Allowance)

- a. This Allowance item shall compensate the Contractor the additional cost to perform the physical hyperbaric intervention into the working chamber to perform the routine tasks described above. Work to be performed and paid under this bid item are acceptable only when receiving written authorization from the City.
- b. Equipment standby time and cost during hyperbaric intervention shall also be included.
- c. For the purpose of this pay item, one work day shall assume to be 8 hours. Payment for actual work hours performed shall be pro-rated accordingly. No premium time will be paid unless otherwise agree with the City.

3.5 CONTACT GROUTING

- A. Perform contact grouting immediately upon completion of the drive in accordance with Section 02441.

3.6 FIELD QUALITY CONTROL:

- A. Ensure that geotechnical instrumentation has been installed, is functional for its intended purposes, and is being monitored as specified in Section 02496.
- B. Settlement monitoring shall be continuous throughout the project within State right of way. Monitoring shall be commenced prior to the work, during and a minimum ten (10) days after completion of all work. If settlement is detected at any time, all work shall cease, and Caltrans Inspector shall be notified immediately.
- C. Immediately notify the ENGINEER, and provide written description of the incident and proper course of corrective actions when any of the following occurs:
 - 1. The CONTRACTOR encounters any one of the conditions described in the contingency plans.
 - 2. Any reach of the installed pipes is off line and grade by more than 50 percent of the maximum allowed.
 - 3. When ground movement reaches 75 percent of the action levels specified herein. The likely cause of the ground movement shall be reported to the ENGINEER and actions shall be promptly taken to limit further settlements. Actions to be taken in response to the ground movement shall be reported to the ENGINEER before being taken, except in emergency situations.
- D. Immediately stop tunneling and notify the ENGINEER, perform an as-built survey of the installed jacking pipes, and provide written description of the incident and operational changes to be made when any of the following occurs:
 - 1. The CONTRACTOR's approved contingency plan fails to address the non-compliance issues in question.
 - 2. When any reach of the installed jacking pipes is off line and grade by more than 100 percent of the maximum allowed.
 - 3. When the observed or measured ground movement exceeds reaches maximum allowable levels specified herein. The Contractor shall halt all tunneling operation and commence the pre-approved submit an action plan to be approved by the Engineer and actions shall be promptly taken to arrest limit further settlement. The action plan shall include the following activities:
 - a. Install and monitor additional instruments and/or perform additional monitoring as directed by the ENGINEER.
 - b. Erect temporary barriers in areas of concerns limiting public access until ground movement is contained.
 - c. Perform a field investigation program including SPT drilling to determine the extent of the ground loss from the ground surface to the depth of the tunnel crown. The investigated area shall also include probing along the tunnel centerline as well as on both sides of the alignment.

- d. Perform compaction grouting to fill in loss ground area.
 - e. Post construction monitoring of ground settlement
 - f. Resume of tunneling operation only after receiving a written authorization from the City.
4. Inadvertent return is detected.
 5. Excessive groundwater leakage into the inside of the jacking pipes.
- E. The cost of actions required to comply with the trigger levels specified herein and to repair any damage and/or refurbish to the roadway pavement and adjacent facilities shall be borne by the CONTRACTOR with no cost to the CITY and Caltrans..
- F. Muck Volume/tonnage:
1. Collect grab samples from the muck/spoil piles at each launching shaft a minimum once a day to test for the water contents of the materials to be disposed off site.

Estimate total daily muck volume/tonnage; and
 2. Measure the average exact muck volume/tonnage per approved method for the entire length of each one single jacking pipe;
 - a. Continuously for every stick of the jacking pipe At least once a day per MTBM heading; and
 - b. When there is a change in the tunneling material.
 3. Compare calculated swell ratio with baseline assumption and update the estimated total daily muck volume/tonnage where necessary
- G. As-built survey: Perform as-built survey from shaft to shaft after removal of the MTBM in accordance with the following:
1. Perform as-built survey of each casing pipe joint for two-pass installation. Each surveyed location shall be at the pipe invert and within a horizontal distance of 0.25 foot from the pipe joint.
 2. Record and submit to the ENGINEER quantities of water leakage at each pipe joint and the total for the entire length of the microtunnel reach.
- F. Field Testing:
1. Sample and perform the necessary test to evaluate the properties of the slurry including pH, solid content, unit density and viscosity. Recover slurry samples for testing at least twice a day from both the influent and effluent sides of the slurry separation unit.
 2. Sample and perform the necessary test to evaluate the properties of the lubricants including density, slump, strength, viscosity, and pH. Recover lubricant sample at least once a day from the point of injection at the batch plant.

****END OF SECTION****

SECTION 02445

INSTALLATION OF CARRIER PIPE IN STEEL CASING

PART 1 -- GENERAL

1.1 SCOPE OF WORK

- A. This section specifies requirements for the installation of the final carrier pipe and fiber optic conduit(s) (for I-8 crossing only) inside a jacked steel casing pipe; including requirements for the design of casing spacers/supports, bulkheads, concrete mixes and placement of backfill concrete.
- B. Product carrier pipes are to be installed either by pipe transport equipment (pipemobile), casing spacers or a railing support system.
- C. Requirements for microtunneling are specified in Section 02443.

1.2 RELATED NON-SSPWC SECTIONS:

- A. Section 02443 Microtunneling

1.3 REFERENCE CODES AND STANDARDS

- A. Unless otherwise indicated, the current editions of the following specifications and standards apply to the Work of this Section.
- B. American Concrete Institute (ACI):
 - 1. 304, Placing Concrete by Pumping Methods.
 - 2. 523, Guide for Cast-in-Place Low Density Cellular Concrete
- C. American Society for Testing and Materials (ASTM):
 - 1. C31, Standard Practice for Making and Curing Concrete Test Specimens in the Field.
 - 2. C39, Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
 - 3. C109, Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens).
 - 4. C138, Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
 - 5. C150, Standard Specification for Portland Cement.
 - 6. C191, Standard Test Methods for Time of Setting of Hydraulic Cement by Vicat Needle
 - 7. C266, Standard Test Method for Time of Setting of Hydraulic-Cement Paste by Gillmore Needles
 - 8. C495, Standard Test Method for Compressive Strength of Lightweight Insulating Concrete.

9. C567, Standard Test Method for Determining Density of Structural Lightweight Concrete.
 10. C796, Standard Test Method for Foaming Agents for Use in Producing Cellular concrete with Preformed Foam.
 11. C869, Standard Specification for Foaming Agents Used in Making Preformed Foam for Cellular Concrete.
 12. C939, Standard Test Method for Flow of Grout for Preplaced Aggregate Concrete (Flow Cone Method)
 13. D6103, Standard Test Method for Flow Consistency of Controlled Low Strength Material (CLSM)
- D. AWWA Manual of Water Supply Practices – M9. “Concrete Pressure Pipe”.
 - E. "Greenbook", Standard Specifications for Public Works Construction (SSPWC), and per the latest revisions by City of San Diego White Book.

1.4 DEFINITIONS

- A. Backfill Concrete: Cementitious material used to fill the void space between the carrier pipe and the initial ground support made of steel casing pipe.
- B. Backfill Grouting: The injection of backfill concrete to fill the void space between the carrier pipe and the initial ground support made of steel casing pipe.
- C. Cellular Concrete: A lightweight cementitious material that contains stable air or gas cells as a preformed foam uniformly distributed throughout the mixture, designed to fill the void space between the carrier pipe and the initial ground support made of steel casing pipe.
- D. Pit: A vertical opening where the depth of the excavation is less than the long dimensions of the excavation. The word “pit” and “shaft” are used interchangeably in this specification.
- E. Shaft: A vertical opening where the depth of the excavation is more than the long dimensions of the excavation. The word “pit” and “shaft” are used interchangeably in this specification.
- F. Slurry Concrete: A type of backfill concrete as specified herein.

1.5 DESIGN REQUIREMENTS

- A. Carrier pipe for I-8 crossing shall be made specifically for the underground installation method specified herein.
- B. Carrier pipe and pipe specials shall be installed within the casing pipe with a minimum clearance:
 1. Between steel casing pipe and carrier pipe = 6 inches; and
 2. Between steel casing pipe and outside of fiber optics product pipe = 2 inches.

as measured between the inside casing pipe wall and the furthest projection of the product pipe’s outer sidewall or bell or as indicated.

The CONTRACTOR shall include additional allowances for pipe transporting equipment, carrier pipe support and adjustment in the carrier pipe's line and grade in the event that the casing pipe is installed out of the line-and-grade tolerances specified in Section 02443.

- C. The length of each section of the carrier pipe shall be as determined by the CONTRACTOR and shall not exceed the clearance between pit/shaft excavation support members measured parallel to the tunnel.
- D. Installation tolerances of the carrier pipe, as measured from the design alignment shown on the Drawings - Refer to construction tolerances described in Section 02443 Part 1.7.
- E. Backfill Concrete
 - 1. Design grout mixes with appropriate properties to fully serve their intended purpose.
 - 2. Completely fill in all annular gap and to seal all the external gap space between carrier pipe joints for protection.
 - 3. Minimum compressive strength tested at 28-day shall be as follows:
 - a. During the submittal phase - 500 psi for any trial design mix(es) to be approved by the City; and
 - b. During construction phase – see Part 3.4.
 - 4. Use of cellular concrete is acceptable for backfilling around the carrier pipe when
 - a. Permeability of the cellular concrete measured in the laboratory is no more than 10^{-6} cm/sec; and
 - b. Groundwater leakage within the steel casing pipe is within allowable.
 - 5. All testing shall be performed in a certified laboratory acceptable to the City.

1.6 SUBMITTALS

- A. Working Drawings: Cross sections and profile drawings indicating relative arrangement of and dimensioned clearances between the as surveyed locations of the casing pipe, the proposed carrier pipe, fiber optics product pipes, casing spacers/supports, concrete/grout pipes, grout ports, termination and intermediate bulkheads, and other equipment and materials used in the performance of the work.
- B. Carrier/Product Pipe Shop Drawings and Methods Statements:
 - 1. Manufacturer's written recommendations for shipping, handling, installing the carrier/product pipe, cathodic protection, and backfill grouting.
 - 2. Carrier pipe for tunneling application, including any design modifications made and special details for the pipe barrel, joints and accessories necessary for underground installation.

3. Methods and procedures for installing carrier pipe and the fiber optic conduits inside the casing pipe to comply with the line and grade requirements and to meet the tolerances and minimum clearances specified herein. When applicable, submit the design of the casing spaces, railing support system, or pipe transporting equipment or "pipemobile.
 4. Methods and procedures for installing carrier/product pipe and fiber optic conduits inside the casing pipe without any damages to the joint(s) and to ensure a watertight connection.
 5. Certification from carrier/product pipe manufacturer stating that the pipes and joints are designed or protected to withstand heat of hydration from backfill grouting, and loads from installation and backfill grouting, without damage. Define maximum allowable injection grouting pressure.
 6. Methods for cleaning and clearing casing pipe of all obstructions, foreign materials and water leakage before and during carrier pipe installation.
 7. Methods for preventing carrier/product pipes from rotating during installation and floating within the casing pipe during backfill grouting.
 8. Methods of performing field testing for final acceptance of the product pipe(s).
- C. Casing Spacers/Support Shop Drawings, Calculations, and Method Statement:
1. Manufacturer's technical literature and written assembly instructions.
 2. Calculations stamped and signed by the pipe spacer/support manufacturer's or CONTRACTOR's design engineer demonstrating the spacers are designed to withstand thrust force and frictional forces during carrier/product pipe installation, buoyancy, backfill grouting pressure, heat of hydration, and construction loads, and have no adverse effect on the pipe.
 3. Calculations stamped and signed by the designer of the carrier/product pipe manufacturer that the pipe and joint are designed to withstand the maximum thrust force and construction misalignment during carrier pipe installation.
 4. Shop drawings showing pipe spacer/support spacing, dimensions, configurations, joints, accessories and details.
- D. Provide manufacturer's technical information and written recommendations for all materials incorporated into the work.
- E. Backfill Concrete or grouting Working Drawings and Methods Statement:
1. Design details for termination and intermediate bulkheads, means and methods for end seal installation and construction, including means to remove all trapped groundwater in the annular space.
 2. Patterns and details for staging, sequencing, performing and monitoring the backfilling operation. For each stage of placement operation, include the means and methods for advancing concrete/grout pipes, placement of injection holes, grout ports, collecting and

disposing of excess and waste material, collecting and disposing of water resulting from operations.

3. Layout and description of equipment and facilities including:

- a. Supply equipment.
- b. Agitators or holding tanks.
- c. Mixers.
- d. Pumps.
- e. Delivery piping and manifolds.
- f. Hookup details including valves, packers, and gauges.

4. Means and methods for:

- a. Proportioning and mixing in the field.
- b. Measuring injection pressure, quantity, and injection rate.
- c. Maintaining injection pressure below specified limits.
- d. Sequencing, staging of the work and establishing basis and threshold values for modifying mixes.
- e. Concrete/grout placement setup, staging and procedures to ensure no voids are left behind.
- f. Furnishing, preparing, and plugging or patching injection holes
- g. Single or Multiple stages/lifts
- h. Estimated volume of material to be placed each lift/stage and verification in the field.
- i. Corrective actions when voids or leakage are found in the backfill concrete

F. Final line and grade of the installed carrier pipe.

G. Qualifications and experience records for the following:

1. CONTRACTOR's design engineer.
2. Superintendent in charge of carrier pipe installation.
3. Backfill installer.
4. Testing Laboratory

H. Product Data:

1. Proposed mix, wet, dry densities and viscosity.
2. Certified test results including unit weight, total air content, unconfined compressive strength and permeability at various elapsed times of the proposed mix from an independent approved laboratory.
3. Initial set time of the grout and the working time before a 15 percent change in density or viscosity occurs.

4. Ability to be pumped for long distance.
5. Mixing and pressure control valves.
6. Additional information required for cellular concrete:
 - a. Type, brand, source, and amounts of cement, fly ash, admixtures, foaming agent, and other additives.
 - b. Cellular concrete foam generator, mixing plant, pump, control valve and pressure gauge assembly at the point of injection.
 - c. Method for transporting and placing cellular concrete minimizing potential variations in the grout properties.
 - d. Permeability of finished product
- I. Daily production records submitted no later than the beginning of the following work day.
 1. Carrier/product pipe installation records shall list footage of carrier/product pipes installed, joint testing results, line and grade, and maximum installation load.
 2. Records of concrete placement including volume placed, grout pipe installation schedule, stationing of placement, injection locations, maximum injection pressure, time of placement, concrete test results as required herein, and designation of cylinder samples prepared that day.
- J. Measures to resolve problems caused by out-of-tolerance casing pipe.
- K. Provide minimum five work days advance notification of meeting date and time for any preconstruction meeting.

1.7 QUALITY ASSURANCE

- A. Qualifications:
 1. Backfill concrete installer specializing in the supply and placement of backfill concrete shall be capable of developing a mix design, batching, mixing, handling and placing backfill concrete in underground conditions.
 2. CONTRACTOR's design engineer shall be a Civil or Structural Engineer registered in California with experience performing the calculations required herein. All work submitted under this section shall be prepared, signed and stamped by Contractor's design engineer. For use of cellular grout, the design engineer shall confirm that number of lifts, pumping pressure, and rate of injection will not collapse the foam.
 3. Superintendent in charge of pipe installation shall be in responsible charge of similar work on a minimum of two projects of equivalent size and complexity within the past 5 years.
- B. Carrier pipe/casing electrical isolation

1. Continually check for electrical isolation as the carrier pipe is inserted into the casing. If the casing becomes electrically shorted to the carrier pipe, determine the cause and corrected immediately. Electrical isolation test procedures are provided in Specification Section 16640.

C. Cellular concrete:

1. Shall be designed in accordance with the requirements of this Section and ACI 523.1 and shall comply with ASTM C869.
2. Proposed testing for each mix shall be as follows:
 - a. Prepare and test samples for 7-day, and 28-day unconfined compressive strength tests according to ASTM C31 for cylinders or ASTM C109 for cubes.
 - b. Two sets of three samples each shall be made from each proposed cellular concrete mix. One set shall be tested at an age of 7 days, and another set shall be tested at an age of 28 days. Cellular concrete test specimens shall be made, cured, stored, and tested in accordance with ASTM C495.
 - c. Determination of total air content of each proposed cellular concrete mix in accordance with ASTM C796. Wet density tests shall be made prior to the addition of the foaming agent and at the point of placement.
 - d. Determination of unit weight of each proposed cellular concrete mix in accordance with ASTM C567.
 - e. Determine the viscosity of the proposed cellular concrete mix in accordance with
 - (1) If fine aggregate is included in the mix – ASTM D6103
 - (2) If no aggregate is included in the mix – ASTM C939

1.8 PRECONSTRUCTION MEETING

- A. Hold a preconstruction meeting at least five work days but not more than 30 work days prior to commencing each of the following:
 1. Transport and installation of the carrier pipe.
 2. Construction stages
 3. Placement of backfill concrete
 4. Carrier/product pipe and joint testing requirements.
- B. Review and discuss the following items at the meetings:
 1. Results of the as-built survey of the steel casing, and necessary modifications have to be made for line and grade adjustments.
 2. CONTRACTOR's proposed carrier/product pipe support, cathodic protection, pressure test set up and procedure for pipes to be installed inside the steel casing.

3. Construction methods, constraints and issues overview.
4. Equipment operating parameters.
5. Review safety procedures as described in the CONTRACTOR's health and safety plan.
6. Quality control procedures and quality assurance requirements.
7. Field Testing and reporting requirements.

PART 2 -- PRODUCTS

2.1 MATERIALS

- A. Water: Potable, and free from deleterious amounts of alkali, acid, organic materials, or other impurities that would adversely affect the setting time, strength, durability, or other quality of the backfill concrete. For cellular concrete, if water is used to pre-form the foam, it shall not exceed 80 degrees Fahrenheit (°F).
- B. Cement: Type II and conform to ASTM C150. Minimum 4 sacks of cement per batch for backfill.
- C. Cellular concrete shall be lightweight hardened cementitious material made from the combination of concrete and a foaming agent with an oven-dried minimum unconfined compressive strength listed in Part 1.5.E.
 1. Shall be designed in accordance with the requirements of this section and ACI 523.1.
 2. Cement: Conform to the requirements of ASTM C150.
 3. Fly Ash:
 - a. Class "C" or "F" fly ash, if used, shall conform to 201 -1.2.5 of SSPWC.
 - b. Use of flyash limited to 20 percent by weight of the total cementitious material in the mix design.
 4. Sand: Gradation shall comply with SSPWC 200-1.5.3 or per manufacturer's written recommendations.
 5. Admixtures: Admixtures, may only be used when specifically approved by the foaming agent supplier in writing.
 6. Foaming Agent:
 - a. Foam shall be generated by combining controlled quantities of air, water, and foaming agent under pressure.
 - b. Foam shall retain its stability until the cement sets to form a self supporting matrix.
 - c. Foaming agent shall comply with ASTM C 869 when tested in accordance with ASTM C 796. The type and manufacturer shall be:

- (1) Mearl Geofoam Liquid Concentrate manufactured by The Mearl Corporation, Roselle Park, NJ;
- (2) Foam Liquid Concentrate manufactured by Cellufoam Concrete Systems;
- (3) Elastizell EF, Foam Liquid Concentrate manufactured by Elastizell Corporation of America;
- (4) Or approved equal.

D. Casing spacers:

1. Longitudinal separation between spacers, when installed on the assembled carrier pipe, shall not exceed the lesser of 8 feet or carrier pipe manufacturer's recommendation, and shall be placed within 2 feet on each side of the coupling or joint. Provide a minimum of 3 casing spacers per pipe length.
2. Design with a minimum factor of safety of 2.0 against all construction loads.
3. Casing spacers shall be designed without a riser at crown (12 o'clock) and a leg at invert (6 o'clock), and shall be symmetrical about the vertical axis.
4. Runner (legs) shall be made with low sliding friction material such as Ultra High Molecular Weight (UHMW) to allow long distance installation.
5. Casing spacers shall provide cathodic isolation of the carrier pipe from the steel casing pipe.
6. Casing spacers shall be non-conductive and sized for the carrier pipe to be installed within the specified line and grade tolerances.
7. Casing spacers shall be designed and installed to facilitate installation of concrete placement pipes and to ensure backfill concrete completely fills the void space between the casing pipe and the carrier pipe.
8. Casing spacers shall incorporate the routing of the fiber optic conduits.
9. Casing spacers shall not deform or become damaged from the heat of hydration of the backfill.
10. Casing spacers shall not damage the carrier pipe.
11. Casing spacers shall not be made of wood or wood skits.
12. Casing spacers shall be adjustable in height to allow for grade correction.

E. Carrier Pipe Support

1. Independent railing support system running the entire length of the casing pipe following the project line and grade and to support the full weight of the carrier/product pipe during transportation and backfill grouting operations.

2. Provisions protecting the carrier pipe from damages against sliding along the railing during placement.

F. Pipe end seals or end penetration seals for carrier pipe shall:

1. Provide cathodic isolation
2. Completely span the annular gap opening from top to bottom
3. Resist backfill pressure
4. Resist heat of hydration.

2.2 EQUIPMENT

A. Pipemobile – To be designed and submitted to the Engineer for approval.

B. Cellular Concrete Foam Generator System:

1. The batch system shall consist of a tank in which the foam liquid concentrate and water are first mixed. This dilute solution shall be discharged from either a pressurized tank or by means of a mechanical pump through a foam-making nozzle in which this solution is blended with compressed air in fixed proportions.
2. The continuous generating system shall consist of a container, which continuously draws the concentrate directly from its shipping container, automatically blends it with water and compressed air in fixed proportions, and forms the stable micro-bubbled foam.

C. Foam refining column or nozzle shall be calibrated for foam quality and discharge rate. The foam nozzle shall be timer-controlled to repetitively discharge any pre-selected quantity or to discharge continuously at a fixed rate.

D. Mixers and Pumps: The rates of mixing and pumping shall be properly adjusted and a continuous flow of cellular concrete shall be obtained at the point of placement.

PART 3 -- EXECUTION

3.1 GENERAL

A. Confirm that the steel casing pipe installation are within the tolerances specified for the design line and grade by performing a field survey of the completed tunnel per Section 02443 Part 3.6 requirements. If any location is out of tolerance, obtain the ENGINEER's acceptance before carrier pipe installation. Implement approved measures to resolve problems caused by out-of-tolerance pipe as required by the ENGINEER at no additional cost to the CITY.

B. Repair, stop and seal any water leakage of the casing pipe that does not meet the criteria specified in Section 02443.

C. Perform work in accordance with the approved submittals.

3.2 CARRIER/PRODUCT PIPE INSTALLATION

- A. Immediately prior to moving a carrier pipe section into the casing pipe:
 - 1. Verify that sections can be installed at their project line and grade within the required tolerance and clearance, and without interference or damage.
 - 2. Clean casing pipe and carrier pipe.
 - 3. Remove all potential obstructions inside the casing pipe including grout port assemblies and thrust rings for intermediate jacking stations.
- B. Acceptable methods of pipe installation: Install and position of each carrier pipe section to correct for any misalignment and to satisfy the minimum clearance requirements
 - 1. Carry each pipe separately into the heading by a "pipemobile" and mate it with the section of pipe already installed; or
 - 2. Adjust casing spacers and push the carrier pipe into the casing pipe with a steady, non-jerking motion. The maximum installation force shall not exceed the manufacturer's recommendations or the allowable thrust load on the carrier pipe barrel and/or joints; or
 - 3. Install an invert railing system to true line and grade. Lay the carrier pipe supporting on top of the railing system and push the carrier pipe inside, while protecting the outside the carrier pipe from any damage.
 - 4. Install the fiber optics product pipe simultaneously with the carrier pipe or in a separate, independent operation. Fiber optics conduits shall be installed more or less in a straight line within the tunnel.
- C. Perform welding or qualification testing of the carrier/product pipe joints as required.

3.3 PLACING BACKFILL CONCRETE

- A. Fill the carrier pipe and fiber optic conduit with water if counter measures against buoyant from backfill grout is not addressed.
- B. Backfill grouting shall be performed through multiple horizontal grout/slickline pipes inserted into the void space between the carrier pipe and casing pipe.
 - 1. Terminate end of the grout pipes regularly along the length of the grout zone to allow an evenly distribution of the backfill concrete.
 - 2. Place grout pipes as close to the inside crown of the casing pipe as possible.
 - 3. If there were "high" points along the casing alignment, terminate additional grout pipes to the high points to minimize air pockets that may trap behind.
- C. Alternatively, perform backfill concrete placement through grout ports embedded along the carrier pipe.

- D. Prior to placing backfill concrete, build bulkheads at intermediate locations and install casing pipe end seals at the pit/shaft locations.
- E. Discharge end of the grout/slickline pipes shall always be embedded inside freshly discharged concrete.
- F. Backfill grouting shall progress from the low end to the high end of the casing pipe filling the entire void.
- G. Apply safe grouting pressure per manufacturer's recommendations and per approved by the City.
- H. Sloping joint for concrete placement in multiple lifts is acceptable as long as the advancing toe of the backfill concrete is always terminated at the end seal or any intermediate bulkheads.
- I. Install an exhaust / vent in the crown on the high end of the casing pipe.
- J. Install shut off valves at all injection pipes.
- K. Placement of cellular concrete shall be completed in multiple lifts/stages and in a short duration to prevent an excessive increase in density, unit weight, consistency and separation.
- L. Maximum vertical height of any lift of cellular concrete backfill shall not exceed 5-ft.
- M. Employ the necessary means to ensure equal quantity of grout is placed on either side of the carrier pipe so as to avoid unbalanced loading.
- N. Continuous placement until backfill concrete overflows from the vent at the high end of the casing pipe and all the following conditions are satisfied:
 - 1. At least 100% of the theoretical calculated backfill concrete volume has been placed
 - 2. A minimum of 1.0 cubic yard of concrete overflows
 - 3. No more air bubbles stop flowing out from the vent hole.
 - 4. When all the required numbers of tested samples are taken.
 - 5. Exhausted grout at each vent is not less than 85 percent of the wet density of freshly injected grout when tested per ASTM C138.
 - 6. Exhausted grout at each vent is not less than 85 percent of the original viscosity of the freshly injected grout when tested per ASTM C939.
- O. Close injection valve.

3.4 ERRANT CONCRETE PLACEMENT

- A. As soon as the following events occur, suspend grouting operations and notify the INSPECTOR immediately:
 - 1. A service connection becomes loose;

2. A joint or bulkhead fails;
3. Grout flow, injection pressures, etcetera, deviate from approved submittals; and
4. Leakage at pipe joint and at bulkhead; and
5. Pipe floatation

The Contractor shall meet with the Engineer as soon as practical after each grout placement and before the placement of the next reach of annular grout to discuss corrective measures or improvements in design or procedures.

3.5 FIELD QUALITY CONTROL

A. Completion of backfill grouting

1. To ensure backfill grouting is completed and no unfilled voids are left behind, the City will perform an inspection which will include opening of unhooked grout ports along the carrier pipe at a frequency of 1 per every 100 feet of installed pipe; where
 - a. No voids are to be found; and
 - b. No continuously leakage of water.
2. Unsatisfied performance will require remedial grouting or other corrective actions. Remedial grouting shall include installation of additional grout pipes from the shaft portal or through grout ports along the carrier pipe.

B. Backfill Concrete

1. Field control tests of the backfill concrete shall be performed by the CONTRACTOR and the results submitted to the ENGINEER. The CONTRACTOR shall provide all equipment and personal and facilities necessary to perform these tests.
2. The following testing shall be performed for backfill concrete:
 - a. Unit Weight: Backfill concrete shall be tested for wet unit weight at the nearest location to the point of injection in accordance with ASTM C138 from each batch of concrete from which compression test cylinders are made. Unit weight of backfill concrete shall be within 5 percent of the unit weight of the approved mix design.
 - b. Viscosity: Backfill concrete shall be tested for viscosity at the nearest location to the point of injection in accordance with ASTM C939 from each batch of concrete from which compression test cylinders are made. Viscosity shall be within 5 percent of the approved mix design.
 - c. Compression Test Cylinders: Compression test cylinders shall be cast from each load, after every change in mix design, and at a frequency of not less than once per 20 cubic yard material placed or every 50-ft of grout placement. Each test

cylinder shall be 6-inch by 12-inch. Test cylinders shall be sampled and made in the field, cured and stored in accordance with ASTM C31.

(1) Sampling Locations:

- (a) Taken from the concrete delivery truck – collect a set of three test cylinders; and
- (b) Taken from a system of valves in the line transporting the backfill concrete, which will allow for collection of test specimens at the nearest location to the point of injection without disconnecting the line from the outlet - collect a set of five test cylinders at each location.
- (c) Specimens shall also be taken from the overflow upon completion of the pour – collect a set of five test cylinders at each location.

(2) Care shall be taken to ensure that cylinder samples are not jostled or moved prior to the initial set. Each set of test cylinders shall be marked or tagged with the date and time of day the cylinders were made and the location in the work where they were sampled.

d. Compression Testing: Two samples collected per Part 3.4.A.2.c.(1).(a) shall be tested at an age of 28 days. The third sample taken at the truck shall be a spare. Two samples each taken per Part 3.4.A.2.c.(1).(b) and (c) shall be tested at 7 days and 28 days. The fifth sample shall be a spare. A strength test result shall be the average of the compressive strengths of the two cylinders made from the same concrete sample and tested at the same age. Testing of the spare sample will be required when there are obvious defects in the other samples collected.

e. Backfill concrete shall be tested for unconfined compressive strength in accordance with ASTM C39, and shall comply with the following criteria:

- (1) Minimum average 28-day compressive strengths for any 5 consecutive samples taken per Part 3.4.A.2.c.(1).(a) shall be 500 psi; and
- (2) No samples taken per Part 3.4.A.2.c.(1).(b) and (c) shall be less than 300 psi.

3. The following testing shall be performed for backfill cellular concrete:

a. Unit Weight: Cellular concrete shall be tested for wet unit weight at the nearest location from point of injection (placement) in accordance with ASTM C567 from each batch of concrete from which compression test cylinders are made. Unit weight of backfill concrete shall be within 5 percent of the unit weight of the approved mix design.

b. Viscosity: Backfill cellular concrete shall be tested for viscosity at the nearest location from point of injection (placement) in accordance with ASTM C939/ASTM D6103 from each batch of concrete from which compression test cylinders are made. Viscosity shall be within 5 percent of the approved mix design.

- c. Air Content: An air content test shall be made from each batch of concrete from which concrete compression test cylinders are made. Air content shall be determined in accordance with ASTM C796.
- d. Compression Test Cylinders: Compression test cylinders shall be cast from each load, after every change in mix design, at a frequency of not less than once per hour. Each test cylinders shall be 3-inch by 6-inch. Test cylinders shall be sampled and made in the field, cured and stored in accordance with ASTM C495.
 - (1) Sampling Locations:
 - (a) Taken from the concrete delivery truck – collect a set of three test cylinders; and
 - (b) Taken from a system of valves in the line transporting the backfill concrete, which will allow for collection of test specimens at the nearest location to the point of injection without disconnecting the line from the outlet - collect a set of five test cylinders at each location.
 - (c) Specimens shall also be taken from the overflow upon completion of the pour – collect a set of five test cylinders at each location.
 - (2) Care shall be taken to ensure that cylinder samples are not jostled or moved prior to the initial set. Each set of test cylinders shall be marked or tagged with the date and time of day the cylinders were made and the location in the work where they were sampled.
- e. Compression Testing: Two samples collected per Part 3.4.A.3.d.(1).(a) shall be tested at an age of 28 days. The third sample taken at the truck shall be a spare. Two samples each taken at the injection point per Part 3.4.A.3.d.(1).(b) and (c) shall be tested at 7 days and 28 days. The fifth sample shall be a spare. A strength test result shall be the average of the compressive strengths of the two cylinders made from the same concrete sample and tested at the same age. Testing of the spare sample will be required when there are obvious defects in the other samples collected.
- f. Cellular concrete shall be tested for unconfined compressive strength in accordance with ASTM C495, except that test specimens shall not be oven cured, and shall comply with the following criteria:
 - (1) Minimum average 28-day compressive strengths for any 5 consecutive samples taken per Part 3.4.A.3.d.(1).(a) shall be 500 psi; and
 - (2) No samples taken per Part 3.4.A.3.d.(1).(b) and (c) shall be less than 300 psi.

C. Cathodic Protection Testing

- 1. Perform field testing and inspection to demonstrate
 - a. Electrical continuity of the steel casing pipe; and

b. Electrical isolation between the steel casing pipe and the carrier pipe before and after placement of backfill concrete.

* *END OF SECTION* *

SECTION 02496

GEOTECHNICAL INSTRUMENTATION

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This Section specifies requirements for designing, furnishing, installing, monitoring, reading, recording, interpreting, maintaining, protecting, and removing or abandoning geotechnical instrumentation. Requirements for the restoration of facilities affected by instrumentation removal or abandonment and maximum allowable or threshold values for geotechnical instrumentation are specified elsewhere.
- B. Protected City installed instrumentation at locations as indicated.
- C. Definitions:
 - 1. Borros-Type Settlement Point: A shallow type of reference point comprising a settlement marker installed 5 feet below the ground surface at locations as indicated.
 - 2. Road Prism - a low profile, PVC plastic protected optical prism attached temporarily on the surface of the road or pavement for surveying any vertical movement.
 - 3. Extensometer: Reference head affixed to the borehole collar and connected to a down-hole anchor and rod assembly to measure displacement of the soil at the anchor location relative to the reference head.
 - 4. Geotechnical instrumentation: Devices measuring groundwater levels and pressures, ground stresses, surface and subsurface settlement, movement and displacement; and movement in existing infrastructures.
 - 5. Inclinator: Probe lowered within a special grouted borehole casing to monitor horizontal displacements occurring during construction relative to a fixed reference point at the top or bottom of the borehole.
 - 6. Interpretation: Including screening of data for correctness, identifying and confirming instrumentation data trends, identifying anomalies, comparing individual instrument data with other data, relating data to construction activities, and determining if potential problems are developing.
 - 7. Instrumentation: A general term applying to measurement devices and appurtenant probes, sensors, cabling, readout devices, battery packs, and data loggers and management systems, including ancillary facilities required for their operation, such as boreholes, casings, housings, and covers.

8. MPBX: Multi-Point Borehole Extensometer. Extensometers with more than one anchor.
9. Standpipe Piezometer(s) / Observation Well(s): Single or multiple slotted and unslotted casing installed in a borehole to monitor groundwater levels.
10. Reference Survey Point: Established point monitored by optical survey or scanning methods to determine as applicable any vertical or lateral displacements occurring during construction.
11. Utility Monitoring Plate – A steel plate with a riser to be installed inside a hollow PVC pipe and to be fixated to the top of an underground utility. Movement of the utility will be registered by the movement of the riser pipe that can be surveyed and recorded.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Section 02160, Pit/Shaft Excavation and Support.
- B. Section 02443, Microtunneling.

1.3 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

- A. American Society for Testing and Materials (ASTM):
 1. ASTM A36 Standard Specification for Carbon Structural Steel.
 2. ASTM C778 Specification for Standard Sand.
 3. ASTM D1586 Test Method for Penetration Test and Split-Barrel Sampling of Soils.
 4. ASTM D1785 Poly (Vinyl Chloride) (PVC) Plastic Pipe, Sch 40, 80, and 120.
 5. ASTM D2487 Classification of Soils for Engineering Purposes.
 6. ASTM D2488 Standard Practice for Description and Identification of Soil (Visual – Manual Procedure).
 7. ASTM D5434 Standard Guide for Field Logging of Subsurface Explorations of Soil and Rock.
- B. Standard Specifications for Public Works Construction (SSPWC).

1.4 SUBMITTALS

- A. General: Make in accordance with Section 01330.
- B. Product Data:
 1. Two sets of manufacturers' catalogs, specifications, installation, operating, and maintenance instructions for each type of data acquisition and management

system, instrumentation component, and monitoring device, all as required for a complete installation.

C. Working Drawings and Methods Statements:

1. Indicate instrumentation types, locations, and layouts in conjunction with detailed plan of existing surface and subsurface utilities at a scale no less than 1:40. Include identification numbers with elevations, stations and offsets, and coordinates as applicable for each type of instrumentation. Include CITY-installed instrumentation on these drawings.
2. Indicate or describe the types, locations, and layouts of all instrumentation installed. Include identification numbers with elevations, stations and offsets, and coordinates as applicable for each type of instrumentation.
3. Instrumentation components and methods for their installation, maintenance, monitoring, removal, and restoration or abandonment. Describe protection of instrumentation to prevent damage.
4. Methods for gathering data and monitoring schedule for instrumentation to be monitored by the CONTRACTOR.

D. Mix Designs: Grout mix designs for grouted instrumentation.

E. Quality Control:

1. Qualifications:

- a. Manufacturer.
- b. Drill hole logger.
- c. Independent test laboratory.
- d. Company installing instrumentation and designated supervisory employee.

2. Certifications:

- a. Calibration certificates for each sensor, probe, readout device, and data logger by manufacturer or independent test laboratory.
- b. By manufacturer for materials specified in Part 2 herein.
- c. By the Geotechnical Engineer or Certified Engineering Geologist certifying review and accuracy of drill hole logs.
- d. By the manufacturer's representative that the CONTRACTOR or the Instrument Installer is installing instrumentation in accordance with manufacturer requirements and that further on-site supervision is not required.
- e. All initial readings of instrumentation taken by the CONTRACTOR.

3. Quality Control Plans:

- a. Proposed methods for identifying instrumentation, including alphanumeric identification, as specified.
- b. Proposed format for presenting raw data readings. Include the date, time, and name of personnel taking measurements or performing monitoring.
- c. Methods for assuring the quality of data readings.
- d. Methods for protecting instrumentation and assuring timely repair or replacement of damaged installations and affected utilities.

4. Records/Reporting:

- a. Drill logs for instrumentation within 48 hours of their completion.
- b. Initial readings of instrumentation within 24 hours of their installation.
- c. Hourly and daily monitoring records within 24 hours of their readings. Submit weekly plot of measured value versus time, including a time history of construction activities likely to influence such readings. Prepare a brief narrative of any instrumentation activities performed and interpretation of available data and trends.
- d. Monthly report – Documenting instrumentation readings at each location from initial to current readings, signed by the Supervising Employee/Instrumentation Specialist responsible for the instrumentation. Incorporate in the report results of all survey performed by others for the project.
- e. Letter or certification document for the abandonment of instrumentation.
- f. Well permit from County of Los Angeles for observation wells, as well as appropriate permits from other agencies.

5. Notifications:

- a. Allow 5 workdays for the ENGINEER to provide locations of CITY-installed instrumentation.
- b. Report immediately if there were any utility interference with the proposed instrumentation.
- c. Report damaged or malfunctioning instrumentation within 8 hours.
- d. Report within 4 hours measurements indicating excessive movements/changes in the CONTRACTOR's or ENGINEER's installed instrumentation.
- e. Give notice to the ENGINEER not less than 48 hours before installing geotechnical instrumentation.

6. As-Built Data:

- a. Three copies of instrumentation installation surveyor's notes within 24 hours of their installation.
- b. Inclinator data and plots acquired during verification of casing and borehole inclination within 1 day of installation. Where borehole is pre-installed along the soldier pile support system, submit inclination of the installed shoring.
- c. Boring logs for all instrumentation holes within 72 hours of completion.
- d. As-built plan of instrumentation type and location accurate to within 0.5 feet and at a scale no less than 1:40 within 24 hours of installing required instrumentation. Include identification numbers with elevations, stations and offsets, and coordinates as applicable for each type of instrumentation.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer: Company with experience specializing in the fabrication of instrumentation of the type specified.
2. Drill hole logger: Geotechnical Engineer or Certified Engineering Geologist certifying accuracy of the boring logs.
3. Instrument Installer: Company with experience specializing in the installation of instrumentation of the type specified.
4. Supervising Employee / Instrumentation Specialist: Registered California Geotechnical Engineer or Certified Engineering Geologist with experience reading, monitoring and interpreting instrumentation of the type specified.

B. All observation wells or piezometers shall be installed by California Licensed C-57 Well Drilling Contractor and the work shall be performed per California Well Standard Bulletin No. 74-90.

C. Preconstruction Meeting: Before the first submittal is made meet with the ENGINEER to discuss the CONTRACTOR's geotechnical instrumentation program to ensure compliance with the Contract requirements.

1.6 DESIGN CRITERIA

- A. Install instrumentation at the locations and depths as specified herein or as indicated in the project plans.
- B. Installations shall be compatible with the subsurface conditions as described in the Geotechnical Report.
- C. Tolerances:

1. Install instrumentation within 3 feet of the proposed location where necessary to avoid obstacles or utilities, or as approved by the ENGINEER.
2. Survey Control: Provided by the CONTRACTOR surveyor for taking instrumentation readings. Achieve a level circuit closure with closure error no greater than $e = 0.61(N)^{1/2}$ where "N" is the number of readings and e is the error expressed in millimeters.
3. Inclinator Casing Installation:
 - a. Twist and vertical misalignment: Less than 1 degree per 10 foot length of casing.
 - b. Vertical misalignment: Less than 3 degrees over the length of the entire casing.
4. Extensometer Installation:
 - a. Within 2 degrees of vertical throughout its length.
 - b. Locate anchors within 3 inches of design depth.
5. Initial Readings:
 - a. Reference point elevation: $\pm 1/10$ inch.
 - b. Reference point position: $\pm 1/4$ inch.
6. Utility Monitoring Point: Install in accordance with indicated requirements at locations per direction of the ENGINEER.

1.7 WORKSITE CONDITIONS

- A. Refer to the Geotechnical Report for a description of existing and anticipated subsurface conditions. The Contractor shall assume difficult drilling for any instrumentation to be installed inside the Conglomerate. Refer to Geotechnical report for issues encountered during the exploratory boring program, and the Contractor shall plan accordingly.
- B. Verify the locations of utilities prior to installing instrumentation. Perform potholing to identify and expose utilities as necessary. Protect utilities encountered and maintain in good working condition.
- C. The Contractor and/or Instrumentation Company will have to develop traffic management plan for work to be performed outside the designated work area within the public right of way.
- D. The Contractor shall coordinate with the Cities and Caltrans for all surveying and scanning work to be performed within the limits of their right of ways.
- E. Obtain all necessary permits and right of entry for installation.

1.08 SEQUENCING AND SCHEDULING

- A. Ensure that the specified instrumentation is installed, calibrated, the initial set of readings taken, and the instrumentation ready for monitoring construction
 - 1. Shaft Instrumentation - At least 14 days prior to shaft excavation; and
 - 2. Tunnel Instrumentation along Alignment – Complete prior to shaft excavation to confirm top of bedrock information.

1.09 PRODUCT DELIVERY, STORAGE, AND HANDLING (NOT USED)

PART 2 - PRODUCTS

2.2 MATERIALS

- A. Bentonite: Standard Wyoming natural bentonite without additives, in granular, pellet or powder form as stated.
- B. Grout Mixes:
 - 1. Cement – Type II or V
 - 2. Provide a cement-bentonite or cement grout/seal mixture to conform to soil characteristics and shall be consistent with the physical properties described in the Geotechnical Report or per Manufacturer’s recommendations and requirements.
 - a. Strength - 50 to 100 psi compressive strength at 28 days
 - b. Seal for stand-alone piezometer / observation Wells – 10^{-6} cm/sec
 - 3. Lean Grout – sand cement mixture consists of a minimum of 1 sack of cement for each ton of sand/cement mixture.
 - 4. Borros Anchor - A lean grout shall be provided for installing Borros-type anchors within drilled hole.
- C. Sand: Conforming to SSPWC Section 200 for Portland Cement concrete, except that 100 percent shall pass the No. 8 sieve.
- D. Water: Water shall be potable, clean, and free of organic matter, alkali, salts, and other impurities.

2.3 EQUIPMENT

- A. Data Management System
 - 1. Provide an integrated system that automatically collects data from the geotechnical instrumentation and place it into a secure database using a data management system. The system shall also include all data from all manually read instruments and optical surveys.

2. The data management system shall be able to display current readings in engineering units for any sensor and the entire history of readings for that sensor.
3. Provide adequate numbers of single and/or multi-channel data-loggers connected to the network by wireless, landline or short haul modem powered by battery pack or AC external power supply with battery backup.
4. Collect or receive data from data loggers remotely and automatically. For data to be taken manually, reporting period will be extended to within 24 hours.
5. Show graphically the current monitoring data (within the last 5 minutes) in relation to historical data.

B. Multi-Point Borehole Extensometers

1. Where indicated, provide multi-point borehole extensometers (MPBXs) to measure subsurface settlement. Extensometer assemblies shall be as manufactured by Geokon, Inc., Lebanon, NH, or approved equal. The assemblies shall include either stainless steel rods or fiberglass rods encased in PVC tubing with groutable anchors as recommended by the manufacturer based on the depth of the installation. Assemblies shall include Geokon Model 4450 vibrating wire head units, or approved equal, for each anchor, with a reading range of 8 inches (2 inches of heave and 6 inches of settlement) and a provision for making manual readings of the anchors.
2. Provide one manual readout unit. Manual readout units shall be Geokon Model 1400-4 Digital Depth Micrometer, or approved equal.
3. Provide seven Geokon 4-channel data loggers with USB Data connections, Model 8002-4-1, or approved equal.
4. Provide one licensed copy of Logview and CSI-LOGGERNET or approved equal. Provide software for downloading, storage and display of extensometer data, as supplied by Geokon, or approved equal.
5. Data logging
 - a. Where surface access is not available within Caltrans right of way - Provide wireless data logger, with D-cell lithium battery pack (for unattended operation) and RF modem (For wireless data transmission), maintenance hole type lid antenna, software with data logger program.
 - b. Where surface access is readily available - Provide required access and accessories associated with the instruments and data collection systems; or the wireless data logger described above.
6. Provide protective caps for the extensometer reference heads as recommended by the instrument manufacturer.

C. Inclinerometers

1. Inclinator Casings – Quick Connect (QC) inclinometer casings having a nominal outside diameter of 3.34 inches and internally grooved to receive inclinometer probe, as manufactured by Slope Indicator Co., 12123 Harbour Reach Drive, Mukilteo, WA, or approved equivalent.
2. Casing Sections – Casing shall be supplied in 10-foot lengths (Slope Indicator part No. 51150310), with no 10-foot length having more than 1 degree of twist before installation.
3. Heavy duty bottom caps (Slope Indicator part No. 51150330), and locking top caps (Part No. 51100550) shall be provided for each inclinometer; Inclinometer Probes and Readout Indicators
 - a. Furnish one complete system on site, and a standby system that can be delivered to site within a 24-hour notice.
 - b. Provide 24 inch wheel base probe (Model 50302500), 50 meter (164 Foot) control cable (Model 50601050), large pulley assembly (Model 51104606), a 650-foot slip-ring cable reel (Part No. 50503100), digitilt Datamate II (Model 50310900), and a DigiPro 2 license key (Model 50310101), all manufactured by the Slope Indicator Co., or approved equivalent.
 - c. Provide attachment(s) to fasten the inclinometer casing to the soldier pile for installation.

D. Observation Wells / Piezometers

1. Provide plastic pipe of 2-inch diameter, polyvinyl chloride (PVC) Schedule 40 in accordance with ASTM D1785 and PVC end caps. The slotted and non-slotted lengths of pipe will be determined by the ENGINEER for each location. Slotted sections will have three rows of factory cut 0.010 inch wide slots equally spaced about the circumference and such rows longitudinally spaced at $\frac{1}{4}$ inch. Unless otherwise indicated, length of the slotted intake section shall be 5-ft.
2. Alternatively, provide groutable vibrating wire piezometers with an accuracy of plus or minus 0.01 feet. Use vibrating wire piezometer sensors rated for 1.5 times the hydrostatic pressure anticipated at the planned depth of installation.

E. Borros-Type Anchor

1. Borros-type anchors shall be Model No. 51808000 manufactured by Slope Indicator Co., Seattle, WA; or equal. Anchor assemblies shall be furnished complete with top cap and other accessories as recommended by the manufacturer

F. Road Prism

1. Optical glass road prism shall be manufactured by GEO Instruments, Narragansett RI or equal.
2. Road prisms may be used in lieu of Borros-Type anchor but on City streets only and shall not be used within Caltrans property.

G. Utility Monitoring Plate

1. Provide minimum 4" square/diameter steel plate connecting to a one-inch diameter steel pipe riser to within 2 inches below the top of the pavement. Attach a coupling at end of riser for ease of removal. Provide any additional hardware and couplers per approved Working/Shop drawings.
2. Use minimum 6-inch diameter Schedule 40 PVC pile as housing protecting the steel pipe riser. The PVC casing shall provide sufficient clearance and decouple from the steel pipe riser for it to move independently but together with the underlying utility.
3. Alternatively, install a single point borehole extensometer to be installed at a depth of 3-ft above the crown of the affected utility.

H. Provide filter material consisting of filter sand conforming to ASTM C778 Standard Specification for Standard Sand for 20-30 sand.

I. Provide terminal boxes for each installation, Model 4999 as manufactured by Geokon, Inc., or approved equal, with an adequate number of connections for the number of gages to be monitored.

J. Provide a vibrating wire readout box Model GK-405 as manufactured by Geokon, Inc., or approved equal.

K. Temporary Surface Cover - Design for AASHTO H20 wheel loading

1. Provide a cast iron unit, a Model 5TT with a fastening bolt, lift sockets and body extension, manufactured by Brooks Products, Inc., El Monte, CA; or similar by Morrison Bros. Co., Dubuque, IA; or approved equivalent. Provide lifting rod or pull-up device for lifting top cover. For Borros anchors, observation wells, and utility monitoring plates - minimum 6-inch in diameter;
2. Provide steel or precast concrete maintenance holes or vaults with steel bolt-down covers for MPBX and inclinometer, sized to accommodate four channel data logger, battery pack and wireless transmission device as appropriate. The maintenance holes and/or vaults shall be rain tight. Furthermore,
 - a. For each inclinometer, the size of the vault or box shall be large enough to accommodate the "large" pulley assembly that will be used to take measurements.
 - b. For each vibrating wire extensometer, the maintenance holes or vaults shall be of sufficient size to also accommodate the extensometer vibrating wire head units.

L. Provide one laptop computer with a heavy duty case. As a minimum, the computer shall have the current operating system utilized by the Engineer (Windows 7 Professional or newer), Microsoft Excel, Powerpoint and Word software, a 15.6 inch screen size (1366x768 pixels), 2.5 GHz Intel Core processor, 8 GB RAM, 1 TB hard drive, a DVD drive, and two USB ports. The case shall be a Pelican Model 1495 with foam cushioning or equivalent.

- M. The CONTRACTOR shall maintain ownership of all equipment described herein. All non consumable equipment can be leased for the duration of the contract.

2.4 SOURCE QUALITY CONTROL (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

- A. The CONTRACTOR shall install and monitoring instrumentation at locations as specified herein or as indicated. Do not install instrumentation within private property unless otherwise indicated or except as directed by the ENGINEER. Provide access for CITY or Caltrans to install Reference Survey Points and/or perform other survey//scanning work as required or per permit conditions
- B. Use drilling equipment of sufficient capacity to advance the instrumentation borehole to the required depth and diameter in overburden soils and the Stadium Conglomerate.
- C. Log all instrumentation borings using the Unified Soil Classification System. Make logs of soil and rock encountered during drilling, including the presence of any contamination. Perform sampling in overburden soils at 5-ft interval, and to confirm top of Stadium Conglomerate within 1-ft of the actual depth. Place a portion of each soil sample in a plastic bag and test the headspace of each soil sample recovered using a photoionization detector (PID) field instrument for qualitatively measurement of volatile organic compounds (VOCs).
- D. Make soil and rock classifications and prepare logs in accordance with ASTM D2487, D2488, and D5434. All installations shall be logged by a qualified person according to Section 1.05. The CONTRACTOR shall preserve and store collected samples for the duration of the Contract.
- E. Inform the City immediately if top of Stadium Conglomerate is found more than 5 feet difference in elevation from the anticipated depth described in the Geotechnical Report.
- F. Protective breathing apparatus for workers and frequency of OVA/PID calibration shall comply with the Health & Safety Plan, which must be available onsite before any subsurface work can proceed on the project.
- G. Provide unrestricted and safe access to geotechnical instrument locations, allowing the ENGINEER to take measurements as necessary.
- H. Provide the CITY with two (2) sets of labeled keys to each locked item.
- I. Mark the boring locations on the ground surface prior to actual drilling. Arrange for existing utilities to be located and provide a minimum of 3 days advance notice to DigAlert and the ENGINEER. Adjust instrumentation location where necessary to avoid subsurface utilities. If the boring location is within 3 feet of a marked utility, expose that facility by hand excavation or potholing prior to drilling.

3.2 INSTALLATION

A. General

1. All installations shall be permitted and conform to permitting requirements for boreholes, monitoring wells, telemetry and all associated instrumentation. The CONTRACTOR shall obtain and pay for all required permits.
2. Tremie bentonite-cement or sand-cement grout from the bottom of the hole.
3. Maintain piezometers. Keep the observation wells in good condition until the end of the Contract.
4. Prior to the installation of each instrument, verify that borehole inclinations are within specified limits.
5. At each Borros anchor, extensometer, earth pressure cell, inclinometer, and piezometer location, install a temporary cover, maintenance hole or vault in accordance with the requirements of Section 2.02. The excavation for installation of the maintenance holes or vaults shall be of adequate depth to accommodate the instrumentation to be installed at each location. Saw cut concrete and asphalt in accordance with permit conditions and/or SSPWC Section 306 requirements for temporary re-surfacing. The maintenance holes or vaults shall be installed on a concrete base. Drainage shall be provided through the concrete base to allow for the percolation of any water that enters the vault into the underlying soils. Make the cover flush with the ground surface or paved surface and fill the annular space between the maintenance holes or vaults and the excavations with lean concrete. Project instrumentation within 3 inches of surface and not closer than 2 inches above bottom of hole or as required for reading the instruments.
6. Cap bottom of casings and fill annular space between casings and sides of holes with cement grout pumped through a pipe or small tube to the bottom of the hole.
7. Provide reference point for measurement of ground (pavement) surface elevation at each instrumentation location.
8. All installation shall be performed under the supervision of the Instrumentation Installer. Confirm operation of each instrument immediately after completion of instrumentation.

B. MPBXs

1. Drill boreholes to the diameter recommended by the manufacturer, at the locations indicated on the project plans, to the required depths to receive the MPBX sensors. Depth of the sensors shall be as indicated or as follows:
 - a. Top sensor – 5-ft below ground surface
 - b. Bottom sensor – 5-ft above the excavated MTBM profile or 5-ft below top of Stadium Conglomerate as measured in the logged borehole, whichever is shallower.

2. Prior to MPBX installation, verify that borehole inclinations are within specified limits. Install extensometers per the project plans and the recommendations of the manufacturer.
3. Backfill the boreholes with cement grout. The CONTRACTOR's borehole logging and sampling program shall be used for the purpose of confirmation of the ground conditions and basis of grout mix design.
4. Verify that MPBX heads are in position to be read manually or automatically.
5. Install vibrating wire head units, connect a data log and take initial readings immediately after installation. Take at least three initial readings of each extensometer instrument to establish an initial value, at intervals of at least 24 hours. If initial readings show large variations, additional readings will be taken to establish an acceptable initial reading.

C. Inclinometer

1. Drill minimum 6-inch-diameter and maximum 8-inch-diameter holes at locations indicated, to the required depths, to receive inclinometers. Case holes with a temporary flush joint type casing to prevent caving. Use of drilling fluid of a self-destroying type, which loses its viscosity after a period of time, is also acceptable. After reaching the required depth, clean the hole of loose earth, particles of cuttings and other debris.
2. Alternatively, inclinometer casing may be attached to the inside flange of the soldier pile in pre-drilled borehole during the time of shoring installation. Bottom of the casing shall be no more than 2-ft above the tip of the soldier pile.
3. Install casings in accordance with the inclinometer manufacturer's installation instructions to the depths indicated on the project plans. Orient one grooved axis of casing perpendicular to the nearest excavation wall. Install casing within 3 degrees of vertical.
4. Fill the annular space between casings and sides of holes with cement grout. The CONTRACTOR's borehole logging and sampling program shall be used for the purpose of confirmation of the ground conditions and basis of grout mix design.
5. Take three readings within 24 hours of each other immediately after the grout has set.
6. Maintain inclinometer casings in operating condition from the time of installation until completion of excavation backfill. Establish and maintain convenient access.

D. Borros-Type Anchors

1. Install in accordance with manufacturer's recommendations and approved submittals.
2. Install as close as possible or along the centerline of the project alignment.

3. Install and complete the initial readings of the Borros anchors prior to commencing of the MTBM drive.

E. Road Prism

1. Road prism shall be fastened by expansion anchor bolt and not by gluing onto the road surface,
2. Install an array of three road prisms (along centerline of the MTBM alignment, 10-ft offset to the right and left) at 25-ft spacing for the tunnel reach located
 - a. Within Lake Murray Blvd right of way west of the receiving shaft. Total number of road prisms to be installed is 9;
 - b. Station 45+40 approximately and total number of road prisms to be installed is 3; and
 - c. Stations 4+50 and 4+75 approximately and total number of road prisms to be installed is 6.
 - d. All other locations – per approval by the Engineer.
3. Establish a direct line of sight between the prisms and the proposed location of the surveying equipment.
4. Install and complete the initial readings of the road prism' locations and elevations prior to commencing of the MTBM drive.

F. Pavement Survey/Scanning/Monitoring

1. To be performed by Caltrans and others per permit conditions

G. Utility Monitoring Plates:

1. Proposed locations to receive Utility Monitoring Plates
 - a. I-8 crossing - one each at launching and receiving shafts as indicated;
 - b. Other crossings – one each at each crossing.
2. Use potholing to confirm the locations and depths of the utilities scheduled to receive the monitoring plate instruments. Mechanical pit excavation is acceptable except the last 2-ft shall be performed by hand-held equipment.
3. Center and install the PVC casing in the excavation to the top of the utility. Backfill the excavation with lean grout. Fill the PVC casing with water or slurry gradually and simultaneously to prevent excessive leakage of grout to inside the casing.
4. Clean out all foreign material inside the PVC casing and insert the monitoring plate with riser to top of utility. Top of the riser pipe shall be cut to no more than 2-inch below the ground surface.

5. Centralize the riser pipe inside the PVC casing and fill the void between with commercial grade oakum, tightly packed, to keep out any foreign material. Make sure the steel riser is free to move together with the underlying utility.
6. Utility Settlement plates are to be installed to a depth above the groundwater table. Notify the Engineer immediately when groundwater is found present. Use single point borehole extensometer if utility monitoring plate cannot be successfully installed at the intended depth.
7. Install and complete the initial readings of the monitoring plates after permeation grouting but prior to commencing of any construction activities.

H. Piezometers / Observation Wells

1. Drill adequately sized holes at locations as indicated to the required depths for receiving the standpipe piezometers. Case holes with a temporary flush joint type casing to prevent caving. Use of a drilling fluid of a self-destroying type, which loses its viscosity after a period of time, is also acceptable. After reaching the required depth, clean the hole of loose earth, particles of cuttings and other debris.
2. Set well casing to the depths required. Flush self-destroying drilling fluid, if used, out of the hole. Place sand filter material in the hole to surround the pipe up to three feet above the screen interval taking care not to place the sand so fast that it arches within the hole and leaves voids. Place a minimum of one foot of granular bentonite, followed with sand cement or bentonite-cement grout to the elevation of the bottom of the protective maintenance hole or vault. In all cases, sand pack and annular seals shall be consistent with permitting requirements.
3. For multiple wells to be installed within the same instrumentation location, separate the top and bottom well intakes by at least 5-ft thick bentonite seal in between. The depths to bottom of the well intakes at each piezometer are as follows:
 - a. Top intake – Locate bottom of the intake at 3-ft below the top of Stadium Conglomerate;
 - b. Bottom intake – Locate bottom of the intake at 5-ft below the excavated invert of the shaft.
4. Develop each standpipe piezometer by bailing to remove excess fines from the filter pack.
5. Groundwater measurements to be taken:
 - a. After well development, demonstrate to the Engineer proper functioning of these wells by measuring rate of rise or fall of water levels in such well therein. For observation wells installed inside the curtain grout ring wall, the measured field permeability has to be below the allowable leakage rate.
 - b. Initial readings for all wells - Perform daily readings at different times of the day during the 3-day initial period, especially during the high and low tides.

6. The Contractor shall also perform monitoring/reading of the groundwater level in wells installed by the City at locations as indicated.
7. The Contractor shall replace any damaged observation wells per requirements in this specification.
8. For placement of vibrating wire piezometers, the piezometer and cavity between filter and diaphragm shall be saturated with clean water. Instrument readings shall be taken of the transducer, thermistor, and the barometric pressure after insertion and completion of the installation.

3.3 FREQUENCY OF READINGS

- A. Coordinate with other agencies have jurisdictions to develop an agreed working schedule and frequency of readings for the proposed activities prior to, during and after tunnel construction.
- B. Monitoring and data interpretation are to be performed by the Contractor, and report to the Engineer per schedule described in Part 1.04.E.4.
- C. For readings taken manually
 1. Instrumentations installed at the shaft locations
 - a. Readings to be taken daily during shaft construction;
 - b. Readings to be taken 3 times a week during MTBM operation
 2. Instrumentations installed along the tunnel alignment
 - a. Within the zone of influence - Position of instrument located at 50-ft ahead and 100-ft behind the advance of the MTBM - readings shall be taken two times a day;
 - b. Outside the zone of influence - readings taken once daily.
- D. For readings taken automatically using data logger or wireless remotely
 1. Instrumentations installed at the shaft locations
 - a. Readings to be taken hourly
 2. Instrumentations installed along the tunnel alignment
 - a. Within the zone of influence - Position of instrument located at 50-ft ahead and 100-ft behind the advance of the MTBM - readings to be taken every 5 minutes;
 - b. Outside the zone of influence - readings taken hourly.

3. At a minimum, data taken shall be uploaded onto the Data Management System daily
4. All readings along any reaches of the drive can be terminated when the instruments showing negligible changes and a minimum two weeks after the carrier pipe is installed and annular grouting is completed.

3.4 MAINTENANCE, REPAIR AND PROTECTION

- A. Protect instrumentation in accordance with manufacturer's recommendations.
- B. Maintain, repair, or replace instrumentation in accordance with manufacturer recommendations. Repair or replace in whole or part as necessary to maintain function within 48 hours of loss of operation or damage at no additional cost to the CITY.
- C. Check any battery powered equipment frequently making sure no loss in data collection and transmission.
- D. Repair damage to facilities in accordance with SSPWC Section 306 requirements for permanent resurfacing.

3.5 FIELD QUALITY CONTROL

- A. Perform installations under the supervision of the manufacturer's representative for as many installations as necessary to verify that the CONTRACTOR's personnel are capable of installing these devices properly without such supervision.
- B. Unless otherwise stated, take three sets of initial readings for all instrumentation installation in the presence of the ENGINEER to demonstrate the adequacy of the installation and to demonstrate the satisfactory operation of the instrumentation.
- C. Complete the installation of the Data Management System sufficiently in advance of the implementation of the geotechnical instrumentation program. Test and demonstrate to the City that the system is operational and working as intended.
- D. Grout mixes for completing the instrument installation shall be approved by the Engineer prior to use.

3.6 REMOVAL

- A. Upon completion of Work, demolish inclinometer casings and extensometers (MPBX) to a minimum depth of 20 feet below the ground surface. Backfill inclinometer and excavation casing with lean concrete. Remove and dispose of traffic covers. Construct new pavement patches in paved areas in accordance with City and/or Caltrans standards.
- B. Before final acceptance of the Work, abandon all observation wells/piezometers, including observation wells installed in exploratory borings completed by City before construction, per City, County, and/or California state regulations. Remove and dispose of protective traffic covers.

- C. Fill remaining holes drilled in masonry or concrete surfaces for the instruments with Portland cement mortar.
- D. Backfill excavations made over and around utilities.
- E. Provide all readout units, data loggers, digital depth micrometers, vibrating wire head units and transducers and wireless vibrating wire interfaces to the Engineer. Dispose of all other components of the instrumentation in an appropriate manner.
- F. Repair damage to surface facilities per City's and Caltrans permit requirements.

END OF SECTION

SECTION 03481

PRECAST CONCRETE UTILITY STRUCTURES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Materials, testing, and installation of precast concrete vaults.
- B. Precast concrete vaults will be furnished and installed as summarized below:
 - Butterfly Valve Vault at Alvarado Rd
 - Butterfly Valve vault at Lake Murray Blvd

1.2 SYSTEM DESCRIPTION

- A. Furnish and install complete precast concrete vaults including appurtenant structural, mechanical and/or electrical mountings or connections required for compliance with Manufacturer’s installation requirements and compliance with applicable building codes and standards.
- B. Precast concrete vault base slabs shall be cast-in-place reinforced concrete formed to include the required sumps and to accept the precast concrete vault wall bases. Joint between precast concrete vault walls and cast-in-place reinforced concrete base slab shall be water-tight.

1.4 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workmen trained and experienced in necessary trades and crafts and completely familiar with specified requirements and methods for proper performance of Work of this section.
- B. Factory testing shall include:

ITEM	TEST FOR	TEST STANDARD (ASTM OR OTHER TEST STANDARD)	FREQUENCY	FIRST TEST PAID FOR BY	RETESTS PAID FOR BY
Concrete Vault	Concrete Strength	ASTM C31	Submit certified test record on request	Contractor	Contractor

1.5 REFERENCES

- A. ASCE 7 Building Code Requirements for Minimum Design Loads in Buildings and Other Structures
- B. ASTM A615 Deformed and Plain Billet-Steel Bars for Concrete Reinforcement
- C. ASTM C31 Making and Curing Concrete Test Specimens in the Field
- D. ASTM C150 Portland Cement
- E. ASTM C913 Precast Concrete Water and Wastewater Structures
- F. ASTM D1557 Laboratory Compaction Characteristics of Soil Using Modified Effort
- G. California Building Code (CBC)
- H. CRSI Manual of Standard Practice

1.6 SUBMITTALS

- A. Furnish the following submittals.

SUBMITTAL	DESCRIPTION
Shop Drawings	Required per structural shop drawing requirements
Catalog Data	Required per catalog data requirements.
Installation Instructions	Required per installation instruction requirements
Engineering Calculations	Required for vaults over 8' deep. Provide engineering calculations sealed by licensed California Civil Engineer. Required to justify designs less than Class 700 specified.
	Required for cast-in-place reinforced concrete base slabs. Provide engineering calculations sealed by licensed California Civil Engineer.
	Required for concrete mix design per engineering calculations requirements; shall be sealed by licensed California Civil Engineer.
Test Record Transcripts	Submit for factory tests per test record transcript requirements
Warranty	Furnish one-year warranty from date of final acceptance

- B. Refer to Section 01300 for definition of requirements for shop drawings, catalog data, installation instructions, engineering calculations, and test record transcripts.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Refer to contract documents for delivery, storage, and handling requirements.

- B. Manufacturer's instruction and warranty requirements for delivery, storage and handling of precast concrete vaults shall be strictly followed.

1.8 PAYMENT

- A. Payment for Work in this section shall be included as part of the lump-sum for which such Work is appurtenant.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Acceptable Manufacturers include:

ITEM	MANUFACTURER	MANUFACTURER LOCATION
Electrical Pull Boxes	J &.R Concrete Products	Perris, CA
	Oldcastle Precast (formerly Utility Vault)	Fontana, CA (800) 626-3860
	Accepted Equal	
Meter Boxes - Concrete	Brooks Products	Ontario, CA
	Eisel Enterprises, Inc.	Placentia, CA
	Jensen Precast	Sparks, NV
	J &.R Concrete Products	Perris, CA
	Oldcastle Precast (formerly Utility Vault)	Fontana, CA (800) 626-3860
	Accepted Equal	
Meter Boxes - Composite	Armorcast 600 series	Ontario, CA
	J &.R Concrete Products PW4 or PW5	Perris, CA
	Applied Engineering Products	Chino, CA
	Accepted Equal	

ITEM	MANUFACTURER	MANUFACTURER LOCATION
Utility Vaults	Brooks Products	Ontario, CA
	Eisel Enterprises, Inc.	Placentia, CA
	Jensen Precast	Sparks, NV
	J & R Concrete Products	Perris, CA
	Olson Precast Company	Rialto, CA
	Oldcastle Precast (formerly Utility Vault)	Fontana, CA (800) 626-3860
	Accepted Equal	

2.2 MATERIALS

- A. Refer to Section 01610 for basic requirements for products and materials.
- B. Precast concrete vaults shall be constructed of the following materials:

ITEM	MATERIAL	SPECIFICATION
Vault	Portland Cement Concrete	Fly ash not permitted
Steel Reinforcing	Steel	
Hatches, Lids, Frames	Metals	See Section 08300
Joint Sealant (between stacked vault sections)	Grout	
	Mortar	
	Plastic Sealing Compound	<ul style="list-style-type: none"> • ConSeal CS-102 • Kent-Seal "Butyl Sealant" • Henry Company "Ram-Nek" • Or Approved Equal

- C. The following product design criteria, options and accessories are required:

ITEM	DESCRIPTION	
Pre-Cast Concrete Vault Sections	Design Surcharge, Lateral Earth Pressure and Buoyancy	<p>AASHTO H-20 Loading</p> <p>For Buoyancy Calculations, assume groundwater level is within 5 feet of ground surface.</p>

ITEM	DESCRIPTION	
	Minimum 28-day Compressive Strength f'_c	4000 psi
	Steel Reinforcing Yield Strength f_y	60 ksi
Cast-in-Place Concrete Base Slabs	Design Surcharge and Buoyancy	AASHTO H-20 Loading For Buoyancy Calculations, assume groundwater level is within 2 feet of ground surface.
	Minimum 28-Day Compressive Strength	4000 psi
	Steel Reinforcing Yield Strength f_y	60 ksi
Rectangular Box Wall Design	Wall Design	Class 700, or submit sealed engineering calculations justifying a lesser design.
	Top Slab Design (See Note 1, 2 and 3 below)	Design for AASHTO H-20
	Dimensions	per ASTM C913 Table X1.1
	Reinforcement	per ASTM C913 Table X1.2

Note 1: The top slab for each vault shall be designed to be removable by means of a mobile crane. Each top slab shall be designed with multiple lifting points (located on the vertical edge of the slab so that the point is not observable. Since the lifting points will be buried, they will require a cap or cover to protect the lifting point from corrosion or fouling by dirt/debris.

Note 2: The top slab for each vault shall be reinforced to allow it to withstand the bending and other forces associated with being removed and reinstalled by the City for future maintenance of the equipment that will be located within each vault.

Note 3: The joint between the removable top slab and the top of vault wall on which it will be supported, and between the base of the vault wall and base slab, shall be made watertight by Contractor around the entire circumference of that joint.

- D. Exterior Waterproofing Membrane for Lake Murray Valve Vault: The Lake Murray Blvd vault shall have 150 Mil DFT minimum of Polyurethane Coating applied to the exterior, with the Polyurethane Coating application being void and pinhole free. Application of the

Polyurethane Coating shall be per the manufactures instructions. The Polyurethane Coating "Applicator Contractor" shall be licensed and certified as an approved applicator by the Polyurethane Coating manufacturer, and shall provide this certification with their bid. The Certified Applicator Contractor shall have certification and experience with the Polyurethane Coating. The Certified Applicator Contractor shall provide references for Polyurethane Coating applications for similar concrete structures and service duty.

- a. The Polyurethane Coating shall fully encapsulate the entire vault (including the underside of the vault floor slab.) The Polyurethane Coating shall be installed in a manner that allows removal of the top slab without damaging the Polyurethane Coating.
- b. The Polyurethane Coating shall be the Utilithane 1600 Polyurethane Coating as manufactured by Prime Coatings Inc., Irvine, California, and shall meet the following specification's and minimum requirements:

The Polyurethane Coating shall be a two-component (2:1 mix by volume) chemically reactive product specially formulated 100 percent solids, aromatic, MDI, pure elastomeric polyurethane coating system, ASTM D16 type V, and NSF 61 potable water approved. The polyurethane shall be applied using a heated "plural component" proportioning equipment system designed for high pressure airless spray configured as specified by the Polyurethane Coating manufacturer to meet job conditions. The Polyurethane Coating material shall contain no extenders or fillers, shall not be a hybrid and shall exhibit the following physical properties:

- a. Tensile strength per ASTM D638 2800-3000 psi,
- b. Elongation per ASTM D638 40%-55%
- c. Abrasion resistance per ASTM D4060 < 50 mg loss,
- d. Impact resistance per ASTM G-14; 330 inch pounds with no failure in the coating
- e. Water Vapor permeability per ASTM D1653-91A 048grms/24 hours/ft²
- f. Maximum recoat window: 24 hours.
- g. ASTM D570 Water Absorption: less that 0.24%-long term test.

Holiday Testing

- a. The completed application of the Polyurethane Coating shall be holiday tested for pinholes and voids. Typical holiday testing shall be at 100 volts per Mil thickness of the Polyurethane Coating specified thickness. Example would be 150 Mils of Polyurethane Coating would be holiday tested at 15,000 Volts. Holiday testing may begin when Polyurethane Coating has become Tack Free.

- E. Access Ladder with Safety Post: Each vault shall be furnished with an OSHA-compliant access ladder and safety post (to accommodate entry to, and departure from, the top of the ladder).
- Each ladder shall be of FRP construction, and shall be compliant with OSHA requirements. Type 316 SS adhesive anchor bolts shall be used for installation. Ladder layout shall be as indicated by the design drawings.
 - Each ladder shall have a retractable device mounted to ladder rungs, to improve safety for Workers using this ladder. This device shall be of Type 304 SS construction, and shall be Bilco Model LU-3, or approved equal.
- F. Floor Sump with FRP Grating & Frame: Each vault shall have a concrete sump constructed in the vault base slab. The FRP Grating and Support Frame/features shall conform to details provided in the Design Drawings.
- G. Wall Penetration Seals (Perpendicular Penetration): Pipes that penetrate vault walls at a perpendicular angle shall be sealed according to the plans.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Make field measurements needed to install precast concrete vaults before submitting shop drawings or ordering. Make minor changes in dimensions and alignments as
- B. needed to avoid utilities or structural conflicts.

3.2 INSTALLATION

- A. Furnish and install precast concrete vaults at locations shown on Plans and submittals.
- B. The following installation standards shall be followed:
1. Manufacturer's installation and warranty requirements
 2. Applicable OSHA and Cal OSHA regulations
 3. Applicable building code requirements
- C. Refer variances between above documents and Contract Documents to Owner's Representative.

- D. Install precast concrete vaults to tolerances recommended by Manufacturer. Unless otherwise shown, install precast concrete vaults true, plumb, and level using precision gauges and levels.

3.3 FIELD QUALITY CONTROL

- A. Field testing shall include:

ITEM	TEST FOR	TEST STANDARD (ASTM OR OTHER TEST STANDARD)	FREQUENCY	FIRST TEST PAID FOR BY	RETESTS PAID FOR BY
Precast Concrete Vaults	Installation & Leakage	Visual inspection of finished installation	1 inspection	Owner	Owner
	Field Performance	Demonstrate compliance to Contract Documents and Manufacturer's printed Literature	1 test	Contractor	Contractor
	11-month Warranty Inspection	Demonstrate compliance to Contract Documents and Manufacturer's printed literature	1 test	Owner	Contractor

END OF SECTION

**SECTION 13300
INSTRUMENTATION AND CONTROL**

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. The CONTRACTOR shall provide all Instrumentation and Control systems (I&C) complete and operable, in accordance with the Contract Documents. The requirements of this Section apply to all components of the I&C unless indicated otherwise.
- B. The Contractor shall provide PLC Programming for the project. Programming of the Central HMI system will be done by the City under a separate contract.
- C. Responsibilities
 - 1. The CONTRACTOR, through the use of a qualified Instrumentation Subcontractor or vendor and qualified electrical and mechanical installers, shall be responsible to the CITY for the implementation of the I&C and the integration of the I&C with other required instrumentation and control devices. Only those suppliers who can demonstrate that they possess the prerequisite capabilities and experience will be considered.
 - a. Demonstrate the company's ability to successfully complete projects of similar size and nature. Provide references (including contact name and telephone number) for at least three projects where the following tasks were performed by personnel directly employed by your firm as a Instrumentation Subcontractor; system engineering and documentation including panel assembly, schematics, and wiring diagrams; software configuration and documentation; field testing, calibration, and start-up; and operating instructions and maintenance training.
 - b. Name the individual persons who will be responsible for office engineering and project management; software configuration; field testing, calibration and start-up; and operator instruction and maintenance training. References called for in the previous item shall include recent project of these individual persons.
 - c. Document that the company is actively in the business of furnishing integrated instrumentation, telemetry, control and electrical equipment for the water and waste water industries.
 - d. Have a qualified service facility with permanent employees located within 100 miles of the job site. Facility to include all tools, spare parts,

and test equipment to repair, calibrate, test and start-up the equipment to be provided on this contract.

e. For this project the prequalified system suppliers are as follows:

- | | | |
|-----|--------------------------------|----------------|
| (1) | ATSI, Temecula | (760) 738-6804 |
| (2) | Vertech, Irvine | (949) 596-7986 |
| (3) | FREEDOM AUTOMATION, Oceanside | (760) 639-4100 |
| (4) | TESCO CONTROLS, INC., Temecula | (951) 308-6450 |

1. Due to the complexities associated with the interfacing of numerous control system devices, the Instrumentation Subcontractor or vendor shall be responsible to the CONTRACTOR for the integration of the I&C with existing devices and devices provided under other Sections and provide a completely-integrated control system free of signal incompatibilities.

2. As a minimum, the Instrumentation Subcontractor or vendor shall perform the following work:

a. Implementation of the I&C:

- (1) Prepare complete and accurate shop drawings
- (2) Design, develop, and electronically verify complete and accurate control panel design and functionality according to specifications.
- (3) Conduct operations and maintenance training for owners personnel on maintenance calibration and repair of all instrumentation provided under this contract.
- (4) Procure hardware and provide a complete and accurate bill of materials.
- (5) Fabricate panels
- (6) Perform factory tests on panels
- (7) Perform bench calibration and verify calibration after installation
- (8) Oversee and guarantee installation for accuracy and totality to design and functionality.
- (9) Oversee, complete set of documents. Label all wires, verify and guarantee complete loop testing results.
- (10) Oversee, document, and certify system commissioning

- (11) Perform comprehensive testing that guarantee accurate and complete system functionality, as well as testing component level accuracy to within manufactures specifications.
 - (12) Provide complete and accurate operations and maintenance manuals to include drawings, BOM, specifications, procedures, calibrations, certificates.
 - (13) Conduct operations and maintenance training for owners personnel on maintenance calibration and repair of all instrumentation provided under this contract.
 - (14) Provide drawings that are complete, correct and of sufficient quantity to have copies located at every maintenance location.
 - (15) Prepare calibration sheets
 - (16) Certify the installation of the I&C
 - (17) Perform complete loop check test on all analog/digital signals. Tests continuity and label all wires on panel.
- b. Integration of the I&C with instrumentation and control devices being provided under other Sections:
- (1) Develop all requisite loop drawings and record loop drawings associated with equipment provided under other Divisions and OWNER-furnished and existing equipment.
 - (2) Resolve signal, power, ground and/or functional incompatibilities between I&C and all interfacing devices. Document and guarantee results.
3. Instrumentation Subcontractor or vendor responsibilities in addition to the items identified above shall be at the discretion of the CONTRACTOR. Additional requirements in this Section and Division 13 that are stated to be the CONTRACTOR's responsibility may be performed by the Instrumentation Subcontractor or vendor.

D. Certification of Intent:

- 1. No Later than five working days after Notice of Apparent Low Bidder, the CONTRACTOR shall submit a certification from the selected Instrumentation Subcontractor or vendor. The certification shall be typed on letterhead paper of the Instrumentation Subcontractor or vendor firm. The certification shall be signed by an authorized representative of the Instrumentation Subcontractor or vendor. The certification shall include the following statements:
 - a. (Company name) "hereby certifies intent to assume and execute full responsibility to the CONTRACTOR to perform all tasks defined under

Subsection 13300-1.1C.3 in full compliance with the requirements of the Contract Documents."

- b. "It is certified that the quotation to the CONTRACTOR includes full and complete compliance with the requirements of the Contract Documents without exception."

E. Documentation of Instrumentation Subcontractor Qualifications:

1. Subcontractor shall have experience in instrumentation and control system projects of size and scope similar to that described herein, in which the applicant performed system engineering, system fabrication and installation, documentation (including schematic, wiring and panel assembly drawings), field testing, calibration and start-up, operator instruction and maintenance training. Each of the references, if cited, must be accompanied by a written confirmation of the accuracy of the data by a managerial member of the control system operational staff.
2. In addition, list the following information for each project above:
 - a. Name of plant, OWNER, contact name, and telephone number. All phone numbers and contacts shall be verified by the applicant before submission.
 - b. Name of manufacturer(s) for the majority of instrumentation provided.
 - c. Type of equipment furnished (i.e., transmitters, recorders, indicators, etc.)
 - d. Manufacturer and model number of DCS, SCADA, or PLC to which the analog system interfaced.
 - e. Date of completion or acceptance.
3. Furnish the name of the individual person who will be responsible for office engineering and management of this project, and the individual who will be responsible for field testing, calibration, start-up, and operator training for this project. Include references of recent projects of these individual persons.
4. Submit specific documentation which verifies that Instrumentation Subcontractor employs the minimum of individuals who have been formally trained in the application of the:
 - a. Indicated operating systems.
 - b. Indicated software packages.
 - c. Indicated graphical user interface software packages.
5. Document that the applicant's company has been actively involved in the instrumentation systems business (under the same corporate name).

1.2 RELATED SECTIONS

- A. The Work of the following Sections applies to the Work of this Section. Other Sections, not referenced below, shall also apply to the extent required for proper performance of this Work.
 - 1. Section 16010 Basic Electrical Materials and Methods
 - 2. Division 13

1.3 REFERENCE SPECIFICATIONS, CODES AND STANDARDS

- A. The Work of this Section shall comply with the current editions of the following codes as adopted by the City of San Diego Municipal code:
 - 1. National Electrical Code (NEC)
 - 2. Uniform Building Code (UBC)
- B. Except as otherwise indicated, the current editions of the following apply to the Work of this Section:
 - 1. ANSI/SA S 5.1 Instrumentation Symbols and Identification
 - 2. ISA-S20 Specification Forms for Process Measurement and Control Instruments

1.4 CONTRACTOR SUBMITTALS

- A. General: Submittals shall be furnished in accordance with the following:
 - 1. Coordinate the instrumentation Work so that the complete instrumentation and control system will be provided and will be supported by accurate shop drawings and record drawings.
 - 2. Symology and Nomenclature: In these Contract Documents, all systems, all meters, all instruments, and all other elements are represented schematically, and are designated by symbology as derived from Instrument Society of America Standard ANSI/ISA S5.1 - Instrumentation Symbols and Identification. The nomenclature and numbers designated herein and on the Drawings shall be employed exclusively throughout shop drawings, and similar materials. No other symbols, designations, or nomenclature unique to the manufacturer's standard methods shall replace those prescribed above, used herein, or on the Drawings.
- B. Instrument Submittal:
 - 1. Provide a complete index that lists each device by tag number, type and manufacturer. Provide a data sheet for each different type of instrument with the list of tag names. Provide a technical brochure for each data sheet.

C. Shop Drawings:

1. General:

- a. Shop drawings shall include the letter head or title block of the Instrumentation Subcontractor. The title block shall include, as a minimum, the Instrumentation Subcontractor's registered business name and address, project name, drawing name, revision level, and personnel responsible for the content of the drawing.
- b. Organization of the shop drawing submittals shall be compatible with eventual submittals for later inclusion in the operations and maintenance information. Submittals that are improperly organized or incomplete for a given loop will be rejected.
- c. Shop drawing information shall be bound in standard size, 3 ring, loose leaf, vinyl plastic, hard cover binders suitable for bookshelf storage. Binder ring size shall not exceed 3 inches.
- d. Interfaces between instruments, motor starters, control valves, variable speed drives, flow meters, chemical feeders and other equipment related to the I&C shall be included in the shop drawing submittal.

2. Project-Wide Loop Drawing Submittal: Furnish a Project-wide Loop Drawing Submittal (PLDS) that completely defines and documents the contents of each monitoring, alarming, interlock, and control loop associated with equipment provided under the instrumentation sections, equipment provided under sections in other Divisions, existing, and OWNER-furnished equipment that is to be incorporated into the I&C. The PLDS shall be a singular complete bound package electronically drafted in INTERGRAPH MICROSTATION format, submitted within 120 days after contract award, and shall include the following:

- a. A complete index in the front of each bound volume. The loop drawings shall be indexed by systems or process areas. All loops shall be tagged in a manner consistent with the Contract Documents. Loop drawings shall be submitted for every analog and discrete monitoring and control loop.
- b. Drawings showing definitive diagrams for every instrumentation loop system. These diagrams shall show and identify each component of each loop or system using legend and symbols from ANSI/ISA S5.4 - Instrument Loop Drawings, and as defined by the most recent revision in ISA. Each system or loop diagram shall be drawn on a separate drawing sheet. Loop drawings shall be developed for loops in equipment vendor supplied packages, equipment provided under the instrumentation sections, and OWNER furnished equipment. The loop drawings shall also show all software modules and linkages. In

addition to the expanded ISA S5.4 requirements the loop diagrams shall also show the following details:

- (1) Functional name of each loop.
 - (2) Reference name, drawing, and loop diagram numbers for any signal continuing off the loop diagram sheet.
 - (3) MCC panel, circuit, and breaker numbers for all power feeds to the loops and instrumentation.
 - (4) Designation, and if appropriate, terminal assignments associated with every manhole, pullbox, junction box, conduit, and panel through which the loop circuits pass.
 - (5) Vendor panel, instrument panel, conduit, junction boxes, equipment and PLC I/O terminations, termination identification wire numbers and colors, power circuits, and ground identifications.
- c. Itemized instrument summary. The instrument summary shall list all of the key attributes of each instrument provided under this Contract. As a minimum, attributes shall include:
- (1) Tag number
 - (2) Manufacturer
 - (3) Model number
 - (4) Service
 - (5) Area location
 - (6) Calibrated range
 - (7) Loop drawing number

3. Test Procedure Submittals:

- a. Submit the proposed procedures to be followed during tests of the I&C and its components.
- b. Preliminary Submittal: Outlines of the specific proposed tests and examples of proposed forms and checklists.
- c. Detailed Submittal: After approval of the Preliminary Submittal, the CONTRACTOR shall submit the proposed detailed test procedures, forms, and checklists. This submittal shall include a statement of test objectives with the test procedures.

- d. Certify in writing that for each loop or system checked out, and all discrepancies have been corrected.
4. Calibration Sheets: Each instrument calibration sheet shall provide the following information and a space for sign-off on individual items and on the completed unit:
- a. Project name
 - b. Loop number
 - c. Tag number
 - d. Manufacturer
 - e. Model number
 - f. Serial number
 - g. Calibration range
 - h. Calibration data: Input, output, and error at 10, 50 and 90% of span
 - i. Switch setting, contact action, and deadband for discrete elements
 - j. Space for comments
 - k. Space for sign-off by Instrumentation Supplier and date
 - l. Test equipment used and associated serial numbers
5. Training Submittals: The CONTRACTOR shall submit a training plan that includes:
- a. Schedule of training courses including dates, durations, and locations of each class.
 - b. Resumes of the instructors who will actually implement the plan.
- D. Operations and Maintenance Information:
- 1. General: Operations and maintenance information shall be based upon the approved shop drawing submittals as modified for conditions encountered in the field during the Work.
 - 2. Operations and maintenance information submitted shall be organized as follows for each process:
 - a. Section A - Loop Drawings
 - b. Section B - Instrument Summary

- c. Section C - Instrument Data Sheets
 - d. Section D - Sizing Calculations
 - e. Section E - Instrument Installation Details
 - f. Section F - Test Results
3. CONTRACTOR-certified results from Calibration Loop Testing, Precommissioning, and Performance Testing shall be included in Section H of the operations and maintenance information.
- E. Record Drawings:
- 1. Keep current a set of complete loop and schematic diagrams which shall include all field and panel wiring, piping and tubing runs, routing, mounting details, point-to-point diagrams with cable, wire, tube and termination numbers. These drawings shall include all instruments and instrument elements. One set of record drawings electronically formatted in INTERGRAPH MICROSTATION format and 2 hard copies shall be submitted after completion of all Precommissioning tasks but before Performance Testing. All such drawings shall be submitted for review before acceptance of the completed Work.

1.5 FACTORY TESTING

- A. Arrange for the Manufacturers of the equipment and fabricators of panels and cabinets supplied under this Section to allow the ENGINEER to inspect and witness the testing of the equipment at the site of fabrication. Equipment shall include the cabinets, special control systems, flow measuring devices, and other pertinent systems and devices. A minimum of 10 working days notification shall be provided to the ENGINEER before testing. No shipments shall be made without the ENGINEER's approval.

1.6 PERIOD FOR CORRECTION OF DEFECTS

- A. Correct all defects in the I&C upon notification from the OWNER within one year from the date of Substantial Completion. Corrections shall be completed within 5 days after notification.

1.7 SYSTEM DESCRIPTION

- A. All instruments shall return automatically and immediately to accurate measurement upon restoration of power after a power failure, except where specifically noted.
- B. Provide and install two-wire transmitters in local panels or enclosures with receiver/indicator/retransmitter as required.
- C. Provide instrument transmitters which produce isolated 4-20 mAdc analog signals. Follow ISA-S50.1.

- D. For instruments which produce a pulse signal, use dc pulse frequency signals whose repetition rate is directly proportional to the process variable over a 10:1 range. Use 24 Vdc power source.
- E. Provide instruments with conformably coated printed circuit boards to prevent damage by dust, moisture, fungus, and airborne contaminants.
- F. Provide instruments complete with mounting hardware, floor stands, wall brackets, or instrument racks.
- G. Use linear, direct reading indicators unless otherwise specified.

1.8 QUALITY ASSURANCE

- A. Provide instrumentation of rugged construction designed for the site conditions. Provide only new, standard, first-grade materials.
- B. Provide material and equipment in accordance with applicable codes and standards, except as modified by the specifications.
- C. Use single source manufacturer for each instrument type. Use the same manufacturer for different instrument types whenever possible.
- D. Coordinate instrumentation to assure proper interface and system integration. Provide signal processing equipment, to include, but not be limited to, process sensing and measurement, transducers, signal converters, conditioners, transmitters, receivers, and power supplies. Coordinate the various subcontractors, equipment suppliers, and manufacturers.

1.9 WARRANTY

- A. Warranty the instrumentation, materials, workmanship, and installation to be free from defects for a period of one year from the date of final acceptance of the equipment.
- B. Furnish and install replacement parts during the warranty period for any defective component at no additional cost. Replace spare parts consumed during the warranty period with new equipment at no additional cost, immediately after use, to restore the spare parts inventory.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Code and Regulatory Compliance: All I&C Work shall conform to or exceed the applicable requirements of the National Electrical Code. Conflicts between the requirements of the Contract Documents and any codes or referenced standards or specifications shall be resolved with the more stringent requirement having precedence.

- B. Current Technology: All meters, instruments, and other components shall be the most recent field-proven models marketed by their manufacturers at the time of submittal of the shop drawings unless otherwise required to match existing equipment.
- C. Hardware Commonality: All instruments that use a common measurement principle (for example, d/p cells, pressure transmitters, level transmitters that monitor hydrostatic head) shall be furnished by a single Manufacturer. All panel mounted instruments shall have matching style and general appearance. Instruments performing similar functions shall be of the same type, model, or class, and shall be from a single Manufacturer.
- D. Loop Accuracy: The accuracy of each instrumentation system or loop shall be determined as a probable maximum error; this shall be the square-root of the sum of the squares of certified "accuracies" of the designated components in each system, expressed as a percentage of the actual span or value of the measured variable. Each individual instrument shall have a minimum accuracy of $\pm 0.5\%$ of full scale and a minimum repeatability of $\pm 0.25\%$ of full scale unless otherwise indicated. Instruments that do not conform to or improve upon these criteria are not acceptable.
- E. Instrument and Loop Power: Power requirements and input/output connections for all components shall be verified. Power for transmitted signals shall, in general, originate in and be supplied by the control panel devices. The use of "2-wire" transmitters is preferred, and use of "4-wire" transmitters shall be minimized. Individual loop or redundant power supplies shall be provided as required by the Manufacturer's instrument load characteristics to ensure sufficient power to each loop component. All power supplies shall be mounted within control panels or in the field at the point of application.
- F. Loop Isolators and Convertors: Signal isolators shall be provided as required to ensure adjacent component impedance match where feedback paths may be generated, or to maintain loop integrity during the removal of a loop component. Dropping precision wire-wound resistors shall be installed at all field side terminations in the control panels to ensure loop integrity. Signal conditioners and converters shall be provided where required to resolve any signal level incompatibilities or provide required functions.
- G. Environmental Suitability: All indoor and outdoor control panels and instrument enclosures shall be suitable for operation in the ambient conditions associated with the locations designated in the Contract Documents. Heating, cooling, and dehumidifying devices shall be provided in order to maintain all instrumentation devices 20% within the minimums and maximums of their rated environmental operating ranges. Provide all power wiring for these devices. Enclosures suitable for the environment shall be furnished. All instrumentation in hazardous areas shall be suitable for use in the particular hazardous or classified location in which it is to be installed.
- H. Signal Levels: Analog measurements and control signals shall be as indicated herein, and unless otherwise indicated, shall vary in direct linear proportion to the measured variable. Electrical signals outside control panels shall be 4 to 20 mA DC

except as indicated. Signals within enclosures may be 1 to 5 VDC. All electric signals shall be electrically or optically isolated from other signals. All pneumatic signals shall be 3 to 15 psig with 3 psig equal to 0% and 15 psig equal to 100%.

- I. Control Panel Power Supplies: All power supplies shall have an excess rated capacity of 40%. The failure of a power supply shall be repeated to the SCADA System.

2.2 OPERATING CONDITIONS

- A. The I&C shall be designed and constructed for satisfactory operation and long, low maintenance service under the following conditions:
 - 1. Environment - Coastal
 - 2. Temperature Range - 32 through 104 degrees F
 - 3. Thermal Shock - 1 degree F per minute, maximum
 - 4. Relative Humidity - 20 through 90%, non-condensing

2.3 SPARE PARTS AND SPECIAL TOOLS

- A. Special Tools: Furnish a priced list of all special tools required to calibrate and maintain all of the instrumentation provided under the Contract Documents. After approval, furnish all listed tools.
- B. Timing of Submittals: All special tools and spare parts shall be submitted before startup starts, and shall be suitably wrapped and identified.

2.4 LIMIT SWITCH

- A. Each intrusion alarm limit switch shall transmit a signal when the monitored door or hatch is not in the closed position.
- B. Each limit switch shall be SPDT, rated for 5 amps. Conduit entrance and terminals shall be epoxy sealed. Limit switch mounting and actuator shall be determined by the Contractor to provide a reliable, positive, and accurate indication of entrance. The switch shall be normally open (actuated closed when the door or hatch is closed). Switch shall be mounted for minimum obstruction of access. Limit switches shall be Type "C" by Square D Class 9007, Allen Bradley 802T, or equal.

Tag No.	Service	Trip Set Point	NEMA Rating
ZS-200	Manhole for InSertion Meter	N/A	4

PART 3 - EXECUTION

3.1 PRODUCT HANDLING

- A. Shipping Precautions: After completion of shop assembly, factory test, and approval, all equipment, cabinets, panels, and consoles shall be packed in protective crates and enclosed in heavy duty polyethylene envelopes or secured sheeting to provide complete protection from damage, dust, and moisture. Dehumidifiers shall be placed inside the polyethylene coverings. The equipment shall then be skid-mounted for final transport. Lifting rings shall be provided for moving without removing protective covering. Boxed weight shall be shown on shipping tags together with instructions for unloading, transporting, storing, and handling at the job site.
- B. Special Instructions: Special instructions for proper field handling, storage, and installation required by the Manufacturer shall be securely attached to each piece of equipment before packaging and shipment.
- C. Tagging: Each component shall be tagged to identify its location, instrument tag number, and function in the system. A permanent stainless steel or other non-corrosive material tag firmly attached and permanently and indelibly marked with the instrument tag number, as given in the tabulation, shall be provided on each piece of equipment in the I&C. Identification shall be prominently displayed on the outside of the package.
- D. Storage: Equipment shall not be stored outdoors. Equipment shall be stored in dry permanent shelters, including in-line equipment, and shall be adequately protected against mechanical injury. If any apparatus has been damaged, such damage shall be repaired by the CONTRACTOR at no additional cost to the OWNER. If any apparatus has been subject to possible injury by water, it shall be thoroughly dried out and put through tests as directed by the ENGINEER. Such tests shall be at no additional cost to the OWNER, and if the equipment fails the tests, it shall be replaced at no additional cost to the OWNER.

3.2 MANUFACTURER'S SERVICES

- A. Manufacturer's services shall be furnished for the following equipment:
 - 1. All flow meters in new or potable water streams that relate to process control, mass balance calculations, and billing of customers.
 - 2. All process analyzers
 - 3. All hazardous gas detection equipment
 - 4. Instruments that require specialized knowledge, such as vibration detectors.
- B. Furnish the following Manufacturer's services for the instrumentation listed above:
 - 1. Perform bench calibration
 - 2. Oversee installation

3. Verify installation of installed instrument
4. Certify installation and reconfirm Manufacturer's accuracy statement
5. Oversee loop testing, prepare loop validation sheets, and certify loop testing
6. Oversee precommissioning, prepare precommissioning validation sheets, and certify precommissioning
7. Train the OWNER's personnel

3.3 INSTALLATION

A. General:

1. All instrumentation, including instrumentation furnished under other Divisions, shall be installed under Division 13 and the manufacturers' instructions.
2. Equipment Locations: The monitoring and control system configurations indicated are diagrammatic. The locations of equipment are approximate. The exact locations and routing of wiring and cables shall be governed by structural conditions and physical interferences and by the location of electrical terminations on equipment. All equipment shall be located and installed so that it will be readily accessible for operation and maintenance. Where job conditions require reasonable changes in approximated locations and arrangements, or when the OWNER exercises the right to require changes in location of equipment that do not impact material quantities or cause material rework, make such changes without additional cost to the OWNER.

B. Conduit, Cables, and Field Wiring

1. All conduit shall be provided under Division 16.
2. All 4-20 mA signal circuits, process equipment control wiring, signal wiring to field instruments, SCADA and PLC input and output wiring and other field wiring and cables shall be provided under Division 16.
3. All SCADA and PLC equipment cables, data highway communication networks shall be provided under Division 13.
4. All terminations and wire identification at I&C equipment furnished under this or any other Division shall be provided under Division 13.

C. Instrumentation Tie-Downs: All instruments, control panels, and equipment shall be anchored by methods that comply with seismic requirements that apply to the site.

D. Ancillary Devices: The Contract Documents show all necessary conduit and instruments required to make a complete instrumentation system. The CONTRACTOR shall be responsible for providing any additional or different type connections as required by the instruments and specific installation requirements at

no additional cost to the OWNER. All such additions and all such changes, including the proposed method of installation, shall be submitted to the ENGINEER for approval before commencing the Work. Such changes shall not be a basis of claims for extra work or delay.

- E. Installation Criteria and Validation: All field-mounted components and assemblies shall be installed and connected according to the requirements below:
1. Installation personnel have been instructed on installation requirements of the Contract Documents.
 2. Technical assistance is available to installation personnel at least by telephone.
 3. Installation personnel have at least one copy of the approved shop drawings and data.
 4. All power and signal wires shall be terminated with crimped type lugs.
 5. All connectors shall be, as a minimum, water tight.
 6. All wires shall be mounted clearly with an identification tag that is of a permanent and reusable nature.
 7. All wire and cable shall be arranged in a neat manner and securely supported in cable groups and connected from terminal to terminal without splices unless specifically approved by the ENGINEER. All wiring shall be protected from sharp edges and corners.
 8. All mounting stands and bracket materials and workmanship shall comply with requirements of the Contract Documents.
 9. Verify the correctness of each installation, including polarity of electric power and signal connections, and making sure all process connections are free of leaks. Certify in writing that for each loop or system checked out, all discrepancies have been corrected.
 10. The OWNER will not be responsible for any additional cost of rework attributable to actions of the CONTRACTOR or the Instrumentation Subcontractor.

3.4 LOOP TESTING

- A. General: Individual instrument loop diagrams per ISA Standard S5.4 - Instrument Loop Diagrams, expanded format, shall be submitted to the ENGINEER for review before the loop tests. The CONTRACTOR shall notify the ENGINEER of scheduled tests a minimum of 30 days before the estimated completion date of installation and wiring of the I&C. After the ENGINEER's review of the submitted loop diagrams for correctness and compliance with the specifications, loop testing shall proceed. The loop check shall be witnessed by the ENGINEER.

- B. Instrument and Instrument Component Validation: Each instrument shall be field tested, inspected, and adjusted to its indicated performance requirement in accordance its Manufacturer's specifications and instructions. Any instrument that fails to meet any Contract requirement, or, in the absence of a Contract requirement, any published manufacturer performance specification for functional and operational parameters, shall be repaired or replaced, at the discretion of the ENGINEER at no additional cost to the OWNER.
- C. Loop Validation: Controllers and electronic function modules shall be field tested and exercised to demonstrate correct operation. All control loops shall be checked under simulated operating conditions by impressing input signals at the primary control elements and observing appropriate responses of the respective control and monitoring elements, final control elements, and the graphic displays associated with the SCADA and PLC. Actual signals shall be used wherever available. Following any necessary corrections, the loops shall be retested. Specified accuracy tolerances for each analog network are defined as the root-mean-square-summation of individual component accuracy requirements. Individual component accuracy requirements shall be as indicated by Contract requirements or by published manufacturer accuracy specifications, whenever Contract accuracy requirements are not indicated. Each analog network shall be tested by applying simulated analog or discrete inputs to the first element of an analog network. For networks that incorporate analog elements, simulated sensor inputs corresponding to 20, 40, 60, 80 and 100% of span shall be applied, and the resulting element outputs monitored to verify compliance to calculated root-mean-square-summation accuracy tolerance requirements. Continuously variable analog inputs shall be applied to verify the proper operation and setting of discrete devices. Provisional settings shall be made on controllers and alarms during analog loop tests. All analog loop test data shall be recorded on tests that include calculated root-mean-square-summation system accuracy tolerance requirements for each output.
- D. Loop Validation Sheets: Prepare loop confirmation sheets for each loop covering each active instrumentation and control device except simple hand switches and lights. Loop confirmation sheets shall form the basis for operational tests and documentation. Each loop confirmation sheet shall cite the following information and shall provide spaces for sign-off on individual items and on the complete loop by the Instrumentation Supplier:
1. Project name
 2. Loop number
 3. Tag number, description, manufacturer and model number for each element
 4. Installation bulletin number
 5. Specification sheet number
 6. Loop description number
 7. Adjustment check

8. Space for comments
 9. Space for loop sign-off by Instrumentation Supplier and date
 10. Space for ENGINEER witness signature and date
- E. Loop Certifications: When installation tests have been successfully completed for all individual instruments and all separate analog control networks, a certified copy of all test forms signed by the ENGINEER or the ENGINEER representative as a witness, with test data entered, shall be submitted to the City together with a clear and unequivocal statement that all instrumentation has been successfully calibrated, inspected, and tested.

3.5 PRECOMMISSIONING

- A. General: Precommissioning shall start after acceptance of all wire test, calibration tests and loop tests, and all inspections have demonstrated that the instrumentation and control system complies with all Contract requirements. Precommissioning shall demonstrate proper operation of all systems with process equipment operating over full operating ranges under conditions as closely resembling actual operating conditions as possible.
- B. Precommissioning Procedures and Documentation: All precommissioning and test activities shall follow detailed test procedures and check lists accepted by the Resident Engineer. All test data shall be acquired using equipment as required and shall be recorded on test forms accepted by the ENGINEER, that include calculated tolerance limits for each step. Completion of all system precommissioning and test activities shall be documented by a certified report, including all test forms with test data entered, delivered to the ENGINEER with a clear and unequivocal statement that all system precommissioning and test requirements have been satisfied.
- C. Operational Validation: Where feasible, system precommissioning activities shall include the use of water to establish service conditions that simulate, to the greatest extent possible, normal final control element operating conditions in terms of applied process loads, operating ranges, and environmental conditions. Final control elements, control panels, and ancillary equipment shall be tested under start-up and steady-state operating conditions to verify that proper and stable control is achieved using local field mounted control circuits. All hardwired and software control circuit interlocks and alarms shall be operational. The control of final control elements and ancillary equipment shall be tested using both manual and automatic (where provided) control circuits. The stable steady-state operation of final control elements running under the control of field mounted automatic analog controllers or software based controllers shall be assured by adjusting the controllers as required to eliminate oscillatory final control element operation. The transient stability of final control elements operating under the control of field mounted, and software based automatic analog controllers shall be verified by applying control signal disturbances, monitoring the amplitude and decay rate of control parameter oscillations (if any) and making necessary controller adjustments as required to eliminate excessive oscillatory amplitudes and decay rates.

- D. Loop Tuning: All electronic control stations incorporating proportional, integral or differential control circuits shall be optimally tuned, experimentally, by applying control signal disturbances and adjusting the gain, reset, or rate settings as required to achieve a proper response. Measured final control element variable position/speed set point settings shall be compared to measured final control element position/speed values at 20, 40, 60, 80 and 100% of span and the results checked against indicated accuracy tolerances.
- E. Precommissioning Validation Sheets: Precommissioning shall be documented on one of two types of test forms as follows:
 - 1. For functions that can be demonstrated on a loop-by-loop basis, the form shall include:
 - a. Project name
 - b. Loop number
 - c. Loop description
 - d. Tag number, description, manufacturer and data sheet number for each component.
 - e. Space for sign-off and date by both the Instrumentation Subcontractor and ENGINEER.
 - 2. For functions that cannot be demonstrated on a loop-by-loop basis, the test form shall be a listing of the specific tests to be conducted. With each test description the following information shall be included:
 - a. Specification page and paragraph of function demonstrated
 - b. Description of function
 - c. Space for sign-off and date by both the Instrumentation Subcontractor and ENGINEER.
- F. Precommissioning Certification: Submit an instrumentation and control system precommissioning completion report that shall state that all Contract requirements have been met and shall include a listing of all instrumentation and control system maintenance and repair activities conducted during the precommissioning testing. Acceptance of the instrumentation and control system precommissioning testing must be provided in writing by the ENGINEER before the performance testing may begin.

3.4 ONSITE SUPERVISION

- A. Furnish the services of an on-site service engineer to supervise and coordinate installation, adjustment, testing, and start-up of the I&C. The ENGINEER will be present during the total period required to affect a complete operating system. A qualified team of the Instrumentation Subcontractor personnel shall be on site for 8

hours to check all equipment, perform the tests indicated in this Section, and furnish startup services.

3.5 PERFORMANCE TEST

- A. The entire I&C shall operate for 7 days without failure.
- B. Furnish all necessary support staff as required to operate the system and to satisfy the repair or replacement requirements.
- C. If any component fails during the performance test, it shall be repaired or replaced and the I&C shall be restarted on another 7-day period.

3.6 TRAINING

- A. General: Train the OWNER's personnel on the maintenance, calibration and repair of all instruments provided under this Contract.
- B. Instructions: The training shall be performed by qualified representatives of the equipment manufacturers and shall be specific to each piece of equipment.
- C. Duration: Each training class shall be a minimum of 8 hours in duration and shall cover, as a minimum, operational theory, maintenance, troubleshooting/repair, and calibration of instruments.
- D. Schedule: Training shall be performed during the precommissioning phase of the project. The training sessions shall be scheduled a minimum of 3 weeks in advance of when the courses are to be initiated. The ENGINEER will review the course outline for suitability and provide comments that shall be incorporated.
- E. Agenda: The training shall include operation and maintenance procedures, troubleshooting with necessary test equipment, and changing set points, and calibration for that specific piece of equipment.
- F. Documentation: Within 10 days after the completion of each session the CONTRACTOR shall submit the following:
 - 1. List of all OWNER personnel who attended the session.
 - 2. Evaluation of OWNER personnel via written testing or equivalent evaluation.
 - 3. Copy of the training materials used including all notes, diagrams, and comments.

3.7 ACCEPTANCE

- A. For the purpose of this Section, the following conditions shall be fulfilled before the Work is considered substantially complete:
 - 1. All submittals have been completed and approved.

2. The I&C has been calibrated, loop tested and precommissioned.
3. The OWNER training has been performed.
4. All required spare parts and expendable supplies and test equipment have been delivered to the ENGINEER.
5. The performance test has been successfully completed.
6. All punch-list items have been corrected.
7. All record drawings in both hard copy and electronic format have been submitted.
8. Revisions to the operations and maintenance manuals information that may have resulted from the field tests have been made and reviewed.
9. All debris associated with installation of instrumentation has been removed.
10. All probes, elements, sample lines, transmitters, tubing, and enclosures have been cleaned and are in like-new condition.

****END OF SECTION****

SECTION 13374

CONTROL PANEL INSTRUMENTATION

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. The CONTRACTOR shall provide all control panel instrumentation, complete and operable, in accordance with the Contract Documents.
- B. The Contractor shall provide PLC Programming for the project. Programming of the Central HMI system will be done by the City under a separate contract.

1.2 RELATED SECTIONS

- A. The Work of the following Sections applies to the Work of this Section. Other Sections, not referenced below, also apply to the extent required for proper performance of this Work:
 - 1. Section 13300 Instrumentation and Control

1.3 CONTRACTOR SUBMITTALS

- A. Submit a preliminary copy of all documentation with the Factory Test procedure submittal. Submit both hard and electronic "as built" documentation with the final O&M manual submittal.

1.4 GENERAL REQUIREMENTS

- A. All software integration and configuration work on the project is to be completed by the approved Instrumentation Subcontractor, unless otherwise noted. Minimum Instrumentation Subcontractor qualifications are detailed in Section 13300.

1.5 PLC LOGIC AND DOCUMENTATION

- A. Logic Configuration shall be:
 - 1. Logically set out in a modular format to follow the process flow.
 - 2. Have all analogs scaled to CITY units (e.g. gpm, psi etc.) and annotate with the units where ever it is used in the program.
- B. Logic Documentation:
 - 1. Contractor is responsible for PLC & device programming. Make maximum use of the documentation facilities which come as part of the Unity Pro programming environment.

2. Use mnemonic signal and variable names that reflect the signal/variable function.
 3. To provide good readability, make full use of the allowable number of characters in a signal or variable name. Excessively contracted naming that detracts from readability will not be accepted.
 4. Provide a title and short English description at the start of each new strategy that explains the purpose of the logic that follows, and how it functions.
 5. For each sub-section of logic within a strategy, provide a comment which explains to another programmer, the functionality of the logic. The purpose is to assist the reader with understanding the intent of the logic.
 6. Provide a title, revision number, date, and page number on every page of logic.
- C. Original Disks and Software Backups: Provide the CITY with:
1. Original disks for all standard Manufacturer's software supplied.
 2. An electronic back-up copy of all "as built" software configured by the Instrumentation Subcontractor.
 3. A record of all device hardware/ software configuration settings including IP addresses used.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Programming software: PLC Program should be written in current version of Unity Pro by Schneider Electric; no equals.

2.2 PROGRAMMABLE LOGIC CONTROLLERS

- A. The microcontroller system and subsystem components shall be Modicon Momentum Unity M1 Series, or approved equal.
- B. Construction: The microcontroller shall be of solid-state design. All CPU operating logic shall be contained within an integral control chassis. Microcontroller terminal base units shall allow for the easy removal and replacement of the controller. The controller shall be capable of operating in a hostile industrial environment without fans, air conditioning, or electrical filtering (up to 60 degrees C and 95 percent humidity).
- C. The PLC shall be a Modicon Momentum Unity M1 processor of the latest design with conformal coating, consisting of the following individual components:

1. Modicon Momentum, M1 Processor Adaptor; Part No. 171CBU98091.
2. Modicon Momentum, Interbus Communications Adapter; Part No. 170INT11000C.
3. Modicon Momentum, 8 Channel 4-20mA Differential Analog Input I/O Base; Part #170AAI03000C.
4. Modicon Momentum, 24 VDC 16 point Discrete Input and 24 VDC 16 point Discrete Output I/O Base; Part #170ADM35010C.
5. Modicon Momentum, Interbus Cable; Part #170MCI00700.
6. Modicon Momentum, Terminal Block; Part #170XTS00100.

PART 3-- EXECUTION

3.1 GENERAL

- A. Seven Day Acceptance Test: After start-up has been completed, the System shall undergo a 7-day acceptance test. The System shall run continuously for 7 consecutive days. During this period, all System functions shall be exercised. Any System interruption and accompanying component, subsystem, or program failure shall be logged for the cause, time of occurrence and duration of each failure. A failure shall cause termination of the 7-day acceptance test. When the cause of a failure has been corrected, a new 7-day acceptance test shall be started.
- B. Each time the CONTRACTOR's technician is required to respond to a System malfunction, a report shall be prepared which includes details on the nature of the complaint or malfunction and the resulting repair action required and taken.

3.2 PLC PROGRAMMING REQUIREMENTS

- A. The Instrumentation Subcontractor shall program the PLC such that it will communicate as specified with both the Central HMI.

3.3 CONTROLLER TUNING

- A. Tuning of closed loop controllers
 1. Tune PID controllers by adjusting the proportional and integral gain parameters to provide a first over shoot of approximately 10 to 15%, and to provide a short settling time.
 2. Where cascade loops are used, tune the innermost loop first, and then the loop outside it. To provide stability ensure that the closed loop response of an outer loop is 5 to 8 times slower than the inner loop.
- B. Document closed loop response
 1. After final tuning of each loop provide trend graphs showing loop

response to a 5% change in setpoint, and a 5% upset in controlled variable.

2. Submit annotated loop response graphics with the Operations manual. Provide a title for each graphic and note tuning parameters used on each sheet.

**** END OF SECTION ****

SECTION 13414

INSERTION MAGNETIC FLOWMETER

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes the requirements of four-wire type insertion magnetic flowmeter.
- B. Related sections include:
 - 1. Section 13300 –Instrumentation and Control.

1.2 SUBMITTALS

- A. Provide catalog data/shop drawings for all products listed in Part 2.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide instruments that are capable of meeting the following performance requirements when installed in accordance with the manufacturer's recommendations:
 - 1. Accuracy: +/-0.2 percent of flow rate.
 - 2. Pipe Sizes: 8 to 320 inches nominal bore.
 - 3. Conductivity: Greater than 50 μ S/cm.
 - 4. Temperature Range: 32 to 140 degrees F.
 - 5. Maximum Pressure: 295 psi

PART 2 -- PRODUCTS

2.1 INSERTION MAGNETIC FLOWMETER

- A. Insertion Magnetic Flowmeters are acceptable provided that the manufacturer's recommendations are met for the installation.
 - 1. Submittal must include manufacturer's straight pipe length recommendations.
- B. Acceptable manufacturers:
 - 1. ABB AquaProbe FEA100 with WaterMaster converter.
 - 2. McCrometer FPI395L with M-Series converter.

3. Or approved equal.

C. Materials:

1. Stainless Steel body.
2. All wetted materials compatible with potable water.

D. Design:

1. Operating pressure: 2-80 psi.
2. Operating temperature: 10-70 Deg F.
3. All components on the flow pipe must be submersible, including cable connections.
4. Flowmeter assembly shall incorporate dielectric union above ball valve.
5. Provide cable between magnetic flow meter and transmitter/converter. Cable shall be of sufficient length to meet field requirements without splices.
6. Adjustable low flow cutoff.
7. Empty pipe alarm.

E. Signal Converter:

1. Provides excitation to sensor, Pulsed DC magnetic field excitation.
2. Configure to display flow volume in engineering units: CFS and tenths.
3. Powered by 24 VDC.
4. 4-20mA signal output.

F. Provide grounding recommended by the manufacturer.

Tag No.	Service	Pipe Size	Range	Drawing
FIT-200	Vault No. 3	66 inches	TBD	E-2

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Install products in accordance with manufacturer's instructions.
- B. Keep foreign matter out of the system.
- C. Instrument Mounting:

1. Mount all instruments where they will be accessible from fixed ladders, platforms, or grade.
 2. Mount all local indicating instruments with face forward toward the normal operating area, within reading distance, and in the line of sight.
 3. Mount instruments level, plumb, and support rigidly.
- D. Flowmeter shall be calibrated and tested per manufacturers recommendations.

PART 4 -- PAYMENT

The bid price for "Insertion Flow Meters" shall include full compensation for doing all work involved installing, calibrating and testing the insertion magnetic flowmeter and all work shown on the electrical drawings and in the related specification sections.

****END OF SECTION****

SECTION 15102

TRIPLE OFFSET METAL SEATED BUTTERFLY VALVE

PART 1 - GENERAL

1.1 DESCRIPTION

- A. This section includes materials, manufacturing, coating, testing, and shipping of metal-seated triple-offset butterfly valve and manual actuator in conformance with AWWA standard C504, as modified herein.

1.2 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS AND ABBREVIATIONS

- A. The applicable portions of the following standards shall apply to the valve. The latest standard shall apply unless otherwise noted.

ANSI B16.34 Valves – Flanged, Threaded, and Welding End ANSI B16.47 Large Diameter Steel Flanges

ANSI 6D Specification for Pipeline Valves (Seat Leakage) ANSI B1.20.1 Pipe Threads, General Purpose (inch) ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings ANSI B46.1 Surface Texture

API 598 Valve Inspection and Testing

AP 609 Butterfly Valves: Double-Flanged, Lug- and Wafer-Type

ASME B16.5 Pipe Flanges and Flanged Fittings: See also ASME B16.47 Series A (MSS-SP-44) or Series B (API 605)

ASME B16.10 Face-to-Face Dimensions

ASME B16.34 Valves – Flanged and Buttwelded End ASME B16.47 Large Diameter Steel Flanges

ASME B31.1 Power Piping ASME B31.3 Process Piping

ASME Standards Materials of Construction ASTM A182 Stainless Steel Forgings

ASTM A216 Carbon Steel Castings

AWWA C207 Standard for Steel Pipe Flanges for Waterworks Service

AWWA C213 Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water

Pipelines

ISO 5211/1 Part-Turn Valve Actuator Attachment Part 1: Flange Dimension
Part 2: Flange and Coupling Performance Characteristics

ISO 5752 Face-to-Face Dimensions Series 13 (Class 150) Series 14 (Class 300/600)

MSS-SP-6 Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End
Flanges of Valves and Fittings

MSS-SP-25 Standard Marking System for Valves, Fitting, Flanges, and Unions

MSS-SP-55 Quality Standard for Steel Castings for Valves, Flanges, and Fittings, and
Other Piping Components

NSF-61 National Sanitation Foundation Standard 61–Drinking Water System
Components – Health Effects (revised 10/88)

OSHA Occupational Safety and Health Act of 1970, as amended SAE Society of
Automotive Engineers

UL Underwriters Laboratories, Inc.

1.3 SUBMITTALS

- A. Submit six copies of shop drawings. Indicate on each shop drawing submittal the name of the project, the name of the Vendor, and the names of any manufacturers and subcontractors. Provide on each shop drawing submittal the following Certification Statement, signed by the Vendor:

"Certification Statement: By this submittal, I hereby represent that I have determined and verified all materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with other applicable submittals and other requirements of the contract documents."

- B. The shop drawings shall include manufacturer's catalog data, calculations and detail construction sheets showing all valve parts and describing each part by material of construction, specification (such as ANSI, ASTM, SAE, or CDA) and manufacturer's part number. Identify each valve by tag number to which the catalog data and detail sheets pertain.
- C. Show valve dimensions including laying lengths. Show port sizes. Show dimensions and orientation of valve actuator, as installed on the valve. Show location of internal stops for gear actuators.
- D. Show valve linings and coatings.
- E. Submit manufacturer's catalog data and descriptive literature.

- F. Submit a report verifying that valve has passed shell and seat tests and that the valve interior linings have passed the test for holidays and lining thickness. Describe test results and repair procedures for the valve. Do not ship valve until the reports have been approved by the City.
- G. Submit the valve warranty certification per paragraph 3.5.

1.4 MANUFACTURERS

- A. The metal-seated triple offset butterfly valve must be Adams, Vanessa or approved equal.

1.5 QUALITY ASSURANCE

- A. Valve Testing: Shop-test each valve body under a test pressure equal to twice its design water-working pressure. The hydrostatic seat test shall be made free of any lubricant. There shall be no visible leakage under all seat tests including API 598. Perform torque tests on actuators to ensure compliance with this specification. The manufacturer shall test the valves. Vendor will be responsible for all above described costs for subsequent valve testing should the initial test fail.
- B. Certification: Prior to shipment, Vendor shall submit for valve and actuator, certified copies of all torque and hydrostatic factory tests, showing compliance with this specification and the applicable standards of AWWA, ANSI, ASTM, etc.
- C. Manufacturer shall have experience in the USA waterworks industry. The manufacturer shall be experienced in the manufacture of metal seated triple-offset butterfly valves of comparable size, capacity, and complexity as specified in this specification. The manufacturer's metal seated triple-offset butterfly valves of comparable size, capacity and complexity, as specified, shall have been successfully used in water service facilities.

PART 2 - MATERIALS

2.1 GENERAL

- A. Supply valve complete with gear actuators, operating nuts, and wrenches required for operation.
- B. Valve shall have the name of the manufacturer and size of the valve cast or molded onto the valve body or bonnet shown on a permanently attached plate.
- C. Direction of flow shall be cast or stamped on the valve body.

2.2 Butterfly Valve

- A. Butterfly valve shall be of high performance design and shall be rated for water working pressures of up to the maximum design pressure or 150 pounds force per square inch gauge (psig), whichever is greater. The valve shall incorporate a triple-offset shaft design with an inclined conical seat and seal geometry which shall create a torque seating operation which shall provide bi-directional zero leakage shut-off and be designed in accordance with ASME

B16.34 and B31.1 with the predetermined torque applied to the valve. Valve shall be of the metal seat design which shall be capable of bi-directional seating against pressures up to 150 psig applied to one side of the disc, with zero pressure applied to the other side of the disc in the CLOSED position, with zero leakage, and without damage or permanent deformation to any part of the valve body, seat, disc, shaft, bearings, or actuator.

1. Valve body shall be cast from carbon steel per ASTM A216 Grade WBC. Valve discs shall be cast from stainless steel per CF8M 316 Stainless Steel. Fabricated bodies and discs shall not be permitted. The valve seating edge shall be located within the valve body fully protected from the flow stream. Valve shafts shall be one-piece 17-4PH or 431 stainless steel construction and shall be designed in accordance with the requirements of API 609. The shaft diameter shall be reduced at the actuator connections so as to put the weakest point outside the valve above the packing. Allowable stresses shall be limited to 33-percent of Ultimate Tensile Strength and 67-percent of Yield Strength in accordance with ASME, Sec. III, Case N62.6. Disc attachment to the shaft shall be by means of Type 316 stainless steel, or Monel parallel keys. Pins of any kind shall not be used for torque transmission.
2. Valve seating surface for the seal ring shall be integral to the valve body or on the disc edge and shall be overlaid with stellite a minimum of 2.5 millimeters in the finished condition WITHOUT EXCEPTION. Valve without the stellite seating surface is not acceptable.
3. Valve shall have a field replaceable "laminated" seal ring retained in the body or on the disc. The seal ring shall be constructed of laminates of stainless steel and graphite. No elastomers shall be used in the sealing system. Seal ring design shall also include the following parameters:
 - a. The seal ring shall be accessible, e.g. replaceable, by positioning the disc in a proper orientation and removing an adjacent pipe spool piece without removing or disassembling the valve.
 - b. The seal ring shall be machined in an inclined conical shape to match the companion surface in the body or on the disc, as appropriate. The overall geometry of the seal ring shall be formed into an elliptical shape to provide resilient seating.
 - c. Each seal ring shall be identical and interchangeable for valves of the same size.
 - d. The seal ring shall be held securely in place by a stainless steel retaining ring bolted in place.
 - e. A spiral wound gasket shall be provided to prevent leakage around the seal ring. Flat static gaskets shall not be used.
 - f. The seal ring shall be indexed and keyed to ensure exact and proper installation or reinstallation without shims.
 - g. No special tools shall be required to install the seal ring.
4. Packing shall be graphite and shall be provided by a minimum of four studs for precision

adjustment and compression of the packing. A minimum of five packing rings shall be provided.

5. Valve bearings shall be No-Resist or Type 316 stainless steel baked PTFE. Bearings shall be sealed from the ingress of particulates. Wetted bronze parts shall be in conformance with ASTM B62, containing not more than: 5-percent zinc, 2-percent aluminum, 8-percent lead, and 83-percent copper plus nickel, plus silicon.
6. Valve body shall be double flanged, flat faced, which shall be able to withstand induced pipe loads without distortion and effect on the movement of the valve disc and seating operation. Flange thickness shall be designed in accordance with ASME Section VII flange design requirements and shall be suitable for mating to connecting pipe flanges conforming to AWWA Class D flange dimensions. Face to face dimensions of the valve shall conform to ISO 5752, Series 13 for Class 150.
7. Operator mounting bracket will be centered with machined register and a minimum of two (2) dowel pins will be used in addition to bracket bolting the absorb torsional load from operator.
8. Valve shaft shall rotate clockwise to close.

2.3 Valve Actuator

- A. Manual actuator shall be provided for the valve and shall be sized in accordance with AWWA C504 and C540, and meet the following requirements:
 1. Provide gear actuators designed for buried service or for exposed service in a vault, as indicated by the design drawings. Actuators shall be of the worm and gear type. Worm gear actuators shall be Limitorque Model HBC, EIM Type WO, Auma GS 160.3 – GS 250.3 Series, or approved equal.
 2. Design gear actuators assuming the differential pressure across the disc is equal to the pressure rating of the valve or 150 psig, whichever is greater.
 3. Gear actuators shall be enclosed, lubricated with oil or grease, and provided with seals on shafts to prevent entry of dirt and water into the actuator. Gears shall be watertight, designed for buried service in groundwater. Actuators shall contain a dial indicating the position of the valve disc.
 4. Worm and gear actuators shall be of the totally enclosed design so proportioned as to permit operation of the valve under full differential pressure rating, or a differential pressure of 150 psig, whichever is greater, with a maximum pull of 80 pounds and a maximum input of 150 feet-pounds on the operating nut. Provide stop limiting devices in the actuators in the OPEN and CLOSED positions. Actuators shall be of the self-locking type to prevent the disc from creeping. Design actuator components between the input and the stop-limiting devices to withstand without damage a pull of 200-pounds for handwheel and an input torque of 300-pounds for operating nuts when operating against the stops.
 5. Self-locking worm gear shall be a one-piece design of gear bronze material (ASTM B427), accurately machine cut. The worm shall be hardened alloy steel (ASTM A322, Grade G41500; or ASTM A148, Grade 105-85), with thread ground and polished.

Helix angle of worm gear shall be designed and cut at 3.5 degrees or less to prevent creep, unless other means to prevent creep are employed and are approved by the City. The actuator shall prevent creeping of the valve under all flow conditions. Provide reduction gearing to meet maximum torque and pull design requirements. The reduction gearings shall run in a proper lubricant.

6. Actuators shall open valve by turning counterclockwise.

2.4 RUBBER PARTS

- A. Rubber parts exposed to water shall be made of a rubber compound that is resistant to free chlorine and monochloramine concentrations up to 10 mg/l in the fluid conveyed.

2.5 MATERIALS

- A. Valve body shall be cast only and shall be equal to or better than ASTM A216 gr. WCB material with wall thickness to exceed 37.5 mm. Comply with applicable ASME B16.34 specifications.
- B. Valve disc shall be cast from stainless steel per CF8M 316 Stainless Steel as a minimum.
- C. Valve shaft material shall be high strength stainless steel, such as ASTM 182 gr. F6a material, and shall meet the requirements of ASTM A564 Type 630, H1150M (17-4 PH).
- D. Valve seal ring shall be laminate type of duplex stainless steel and graphite. Stainless steel meeting ASTM UNS S31803 SS (22-percent chrome ferritic-austenitic) may be used.
- E. Valve packing shall be a combination of graphite die-formed rings and braided graphite rope anti-extrusion rings.
- F. Packing gland and end-cap shall be stainless steel.
- G. Valve bottom flange bolting must be in compliance with ASME B31.1 and B31.3, and shall use at least four (4) retaining bolts. Material of bolting to be ISO 3506 A2 gr. 304 SS.

PART 3 - EXECUTION

3.1 PAINTING AND COATING

- A. Coat metal valves and accessories with 12 mil minimum fusion bonded epoxy or approved equal. Apply the specified prime coat at the place of manufacture. Line the interior metal parts of metal valves 4-inches and larger, excluding seating areas and bronze and stainless steel pieces, with 12 mil minimum fusion bonded epoxy or approved equal. Lining and coating of valves shall be in accordance with AWWA C-550.

3.2 MOUNTING GEAR ACTUATORS

- A. The manufacturer shall select and mount the gear actuator and accessories on each valve and stroke the valve from fully open to fully closed prior to shipment.

3.3 VALVE TESTING

- A. Test the valve interior linings at the place of application with a low-voltage (22.5 to 80 volts, with approximately 80,000-ohm resistance) holiday detector, using a sponge saturated

with a 0.5-percent sodium chloride solution. The lining shall be holiday free.

- B. Measure coating thickness with a calibrated magnetic- type or electronic dry-film thickness gauge. Provide dry-film thickness gauge as manufactured by Mikrotest or Elcometer. Check each for the correct dry-film thickness. Do not measure within eight hours after application of the coating.
- C. Pressure test the valve body and the valve seat according to the pressures and procedures described in this specification or in the AWWA Standard. Valve shall show zero leakage.
- D. Operate manual valve through 10 full cycles of opening and closing. Valve shall operate from full open to full close without sticking or binding. If valve sticks or binds, repair or replace the valve and repeat the tests.
- E. Actuators shall operate valve from full open to full close through 10 cycles without binding or sticking. The pull required to operate a hand wheel under full design pressure shall not exceed 80 pounds. The torque required to operate the valve having 2-inch AWWA nuts under full design pressure shall not exceed 150 foot-pounds. If actuators stick or bind or if pulling forces and torques exceed the values stated previously, repair or replace the actuators and repeat the tests. Fully lubricate actuators in accordance with the manufacturer's recommendations prior to operating.
- F. Actuator stops shall withstand a pull of 200 pounds for handwheel or chainwheel actuators, and an input torque of 300 foot pounds for 2-inch AWWA nuts, without damage to any component. Repair or replace any damaged component and repeat the test until the actuator passes the test without damage.

3.4 SHIPPING

- A. Package the equipment adequately to prevent damage during shipping. Before shipping flanged valve, clean flanges by wire brushing and coat unpainted machined surfaces of the flange with strippable, rust-preventative compound. Fasten full-face flange protectors of waterproof plywood or weather-resistant pressboard, of a diameter at least that of the outside of the flange, to each flange to protect both the flange and the interior of the valve. Small valves may be fully packaged at the manufacturer's option. Bolt or otherwise fasten valves to skids or other supports so as to preclude damage in subsequent handling.

3.5 VALVE WARRANTY

- A. The manufacturer shall warrant the valve and valve actuator to be free from defects in materials, workmanship, and performance for five years from the date of acceptance of the valve by the City. Contractor shall provide the City a copy of the warranty per Scontrolection 6-8.3, Warranty.

****END OF SECTION****

SECTION 16010

BASIC ELECTRICAL REQUIREMENTS

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section summarizes general requirements of electrical work specified in Division 16.

1.2 DESCRIPTION OF WORK

- A. The Contractor shall furnish labor, materials, equipment and services to store, transport, install, calibrate, and make operational electrical systems and equipment supplied under this contract. Include wiring, conduits, fittings, physical support systems, incidentals, and connections to link the individual components into an integrated system. Typical materials that may be incidentals are terminal lugs not furnished with vendor-supplied equipment, compression connectors for cables, splices, junction and terminal boxes.
- B. The Contractor shall install, wire, and connect all equipment and items furnished by CITY and under other divisions that require electrical connections unless otherwise indicated or specified. Include all field connections and terminations to all panels, control equipment and devices, instruments, and to all vendor-furnished packaged equipment.
- C. The Contractor shall include all concrete work required for encasement, installation, or construction of the Work specified in Division 16. Furnish 3000-psi concrete; the following shall apply:
 - 1. Consolidation of encasement concrete around duct banks shall be by hand puddling, and no mechanical vibration shall be permitted.
 - 2. A workability admixture shall be used in encasement concrete, which shall be a hydroxylated carboxylic acid type in liquid form. Admixtures containing calcium chloride shall not be used.
 - 3. Concrete for encasement of conduit or duct banks shall contain an integral red-oxide coloring pigment in the proportion of 8 pounds per cubic yard of concrete.
- D. The Contractor shall test all electrical connections and circuits for proper installation and operation.

1.3 PERMITS

- A. The Contractor shall procure and pay for permits and certificates required by local and state ordinances and fire underwriter's certificate of inspection.

1.4 SUBMITTALS

- A. The contractor shall furnish within 30 days, a complete list of all materials, equipment, apparatus, and fixtures proposed for use. The list shall include type, sizes, names of manufactures, catalog numbers, and such other information required to identify the items.

- B. The Contractor shall include the following information in the submittals for this division:
 - 1. Manufacturer, detailed items description, drawings, catalog literature and data edited to indicate specific items, such as conduit, fittings, supports, wire, cable, junction boxes, and pull boxes being provided.
 - 2. All equipment shall be submitted in a common submittal. All installation details shall be submitted in a common submittal.
 - 3. Installation detail drawings. Include typical details for raceway hangers and supports.
 - 4. Complete material lists for the Work of this division. Such lists shall state the manufacturer and brand name of each item or class of material. Include shop drawings for all grounding work not specifically indicated.
 - 5. Shop drawings are required for materials and equipment listed in other sections. Shop drawings shall provide sufficient information to evaluate the suitability of the proposed material or equipment for the intended use, and for compliance with these Specifications. The following shall be included:
 - a. Front, side, rear elevations and top views with dimensional data.
 - b. Location of conduit entrances and access plates.
 - c. Component data.
 - d. Connection diagrams, terminal numbers, wire numbers, internal wiring diagrams, conductor size, and cable numbers.
 - e. Method of anchoring, seismic requirement; weight.
 - f. Types of materials and finish.
 - g. Nameplates.
 - h. Temperature limitations, as applicable.
 - i. Voltage requirement, as applicable.
 - j. Front and rear access requirements.
 - 6. Nameplate schedules.

- C. Maintenance manuals of sufficient detail to enable a qualified technician to perform maintenance and repair.

- D. Record Drawings: In addition to the record drawings as part of the record drawings requirements, the Contractor shall show depths and routing of all underground duct banks.

1.5 QUALITY ASSURANCE

- A. The drawings diagrammatically indicate the desired location and arrangement of outlets, conduit runs, equipment, and other items. The Contractor shall determine the exact locations in the field based on the physical size and arrangement of equipment, finished elevations, and other obstructions. Locations shown on the drawings, however, shall be adhered to as closely as possible.
- B. All conduit and equipment shall be installed in a manner to avoid all obstructions and to preserve headroom and keep openings and passageways clear. Where the drawings do not indicate exact locations, such locations shall be obtained from the Resident Engineer. Where equipment is installed without instruction and must be moved, it shall be moved without additional cost to the City.
- C. All materials and equipment shall be installed in accordance with printed recommendations of the manufacturer, which have been reviewed by the Resident Engineer. Workmen skilled in this type of work shall accomplish the installation and installation shall be coordinated in the field with other trades so that interference's are avoided.
- D. All Work, including installation, connection, calibration, testing, adjustment, and paint touchup, shall be accomplished by qualified, experienced personnel working under continuous, competent supervision. The completed installation shall display competent work, reflecting adherence to prevailing industrial standards and methods.
- E. The Contractor shall furnish adequate means for and shall fully protect all finished parts of the materials and equipment against damage from any cause during the progress of the Work and until acceptable by the Resident Engineer.
- F. All materials and equipment, both in storage and during construction, shall be covered in such a manner that no finished surfaces will be damaged, marred, or splattered with water, foam, plaster, or paint. All moving parts shall be kept clean and dry.
- G. The Contractor shall replace or have refinished by the manufacturer, all damaged materials or equipment, including faceplates of panels and switchboard sections, at no cost to the City.
- H. The Contractor shall perform all tests required by the Resident Engineer or other authorities having jurisdictions. All such tests shall be performed in the presence of the Resident Engineer. The Contractor shall furnish all necessary testing equipment and pay all costs of tests, including all replacement parts and labor necessary due to damage resulting from damaged equipment or from test and correction of faulty installation. The following testing shall be accomplished:
 - 1. Testing for the ground resistance value specified in Section 16450 – GROUNDING.

2. Insulation resistance tests specified in Section 16120 – WIRES AND CABLES.
 3. Operational testing of all equipment furnished and/or connected in other sections of Division 16, including furnishing of support labor for testing.
- I. Any test failure shall be corrected in accordance with the industry practices and in a manner satisfactory to the Resident Engineer.
- J. The Contractor shall perform all work in accordance with all applicable provisions of the following:
1. All applicable requirements of the rules and regulations of the local bodies having jurisdiction. In addition, the Work of this division shall comply with the requirements of the current edition of the Standard Specifications for Public Works Construction (SSPWC) Subsection 209-1, together with the latest adopted editions of the Regional and City of San Diego Supplement Amendments.
 2. NFPA-70 “The National Electrical Code”, latest edition.
 3. ANSI C-2 “The National Electrical Safety Code”, latest edition.
 4. NECA “National Electrical Contractors Association” guidelines.
 5. All applicable requirements of the Federal Communication Commission and the Federal Aviation Authority.
 6. Government Standards:

FS W-C-596E/GEN(1) Outlet, Electrical Power	Connector, Plug, Receptacle and Cable
FS W-S-896E/GEN(1)	Switches, Toggle (Toggle and Lode), Flush Mounted (ac)
FS WW-C-581D, E Coupling, Elbow, and Nipple, Electrical Conduit: Steel, Zinc Coated	Conduit, Metal, Rigid, And Intermediate; And

Commercial Standards:

ANSI C80.1 Specification for	Zinc Coated, Rigid Steel Conduit,
ANSI C80.4 Metallic Tubing, Specifications for	Fittings for Rigid Metal Conduit and Electrical
ANSI/UL 467 Standard for	Grounding and Bonding Equipment, Safety

ASTM B3	Soft or Annealed Copper Wire
ASTM B8	Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, and Soft
ASTM B33	Specification for Tinned Soft or Annealed Cooper Wire for Electrical Purposes
ASTM D1784	cell classification PVC 1223-A, B, or C
ICEA S-61-402	Thermoplastic - Insulated Wire and Cable
ICEA S-66-524, NEMA WC7	Cross-Linked, Thermosetting, Polyethylene Wire and Cable
ICEA S-68-516, NEMA WC8	Ethylene Propylene Rubber Insulated Wire and Cable
NEMA 250 maximum	Enclosures for Electrical Equipment (1,000 volts maximum)
UL 6	Rigid Metal Electrical Conduit
UL 44	Rubber - Insulated Wire and Cable
UL 514	Electrical Outlet Boxes and Fittings

- K. Construction and installation of all electrical equipment and materials shall comply with all applicable provisions of the OSHA Safety and Health Standards (29CFR1910 and 29CFR 1926, as applicable), State Building Standards, and applicable local codes and regulations.
- L. Unless otherwise specified, the Contractor shall use new materials of current production which conform to standards established by Underwriter's Laboratories, Inc., and are so marked or labeled, together with manufacturer's brand or trademark. Equipment and material which are not covered by UL standards will be accepted provided such material is listed, labeled, certified, or otherwise determine to meet safety requirements of an independent nationally recognized testing laboratory acceptable to the local code-enforcement agency having jurisdiction. Equipment of a class which no independent nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards such as NEMA or ANSI. Submit certified test reports and shop drawings as evidence of compliance.

- M. The Contractor shall use one manufacturer for like items and associated equipment. Components of an assembled unit need not be products of the same manufacturer.
- N. The Contractor shall not interfere with continuous operation of the CITY's equipment, unless otherwise approved by the CITY.
- O. The Contractor shall inspect the intended storage space at the site. Provide conditioning as required to protect the equipment. Provide a written report on the adequacy of storage.
- P. The Contractor shall protect all stored and installed materials and equipment from physical damage, adverse weather conditions, moisture, and corrosion until final acceptance. Replace or repair any damaged equipment to the satisfaction of the Engineer.

1.6 CLEANUP

- A. **Cleaning of Materials and Equipment:** All parts of the materials and equipment shall be thoroughly cleaned. Exposed parts shall be thoroughly clean of cement, plaster, and other materials. All oil and grease spots shall be removed with a nonflammable cleaning solvent. Such surfaces shall be carefully wiped and all cracks and corners scraped out. Paint touchup shall be applied to all scratches on panels and cabinets. Electrical cabinets or enclosures shall be vacuum cleaned before final acceptance.
- B. **Cleaning of the Site:** During the progress of the Work, the Contractor shall clean the premises and leave the premises and all portions of the site free of debris.

1.7 DEMOLITION AND RELATED SITES WORK

- A. **Installation of New Equipment in Existing Structures:**
 - 1. Installation of certain new equipment and devices is required in existing structures. For this phase of the Work, the Contractor shall remove existing equipment or devices, install new equipment as indicated, remove existing conductors from existing raceways, and pull new conductors in existing raceways, reconnect existing conductors or furnish and install new conduit and wires.
 - 2. The Contractor shall visit the sites before bidding and carefully examine existing installations so that its proposal will reflect all the Work necessary to provide a complete installation so that the resulting installation will function as required. Include in the bid price all costs of labor and materials necessary to complete installations.
- B. **Installation of Temporary Equipment:**
 - 1. To facilitate continuous operation of existing equipment, temporary equipment shall be provided where indicated. The Contractor shall submit installation and connection details for review and acceptance. Temporary installations shall be

provided at no additional cost to the City.

2. All cables, conduits, and fittings used in temporary connections shall not be reused to install permanent connections. Salvaged items shall be returned to the City.

C. Plant Monitoring Power and Control Shutdowns:

1. Existing operations shall be continued during this demolition process. The Contractor shall carefully examine all Work to be done in, on, or adjacent to existing equipment. Work shall be scheduled, subject to the City's approval, to minimize required shutdown time of sites. The Contractor shall submit a written request, including sequence and duration of activities to be performed during shutdown.
2. The Contractor shall perform all switching and safety tagging required for shutdowns or to isolate existing equipment. In no case shall the Contractor begin any Work in, on, or adjacent to existing equipment without written authorization of the Resident Engineer.

D. Modifications to Existing Electrical Facilities:

1. The Contractor shall provide all modifications or alterations to existing electrical facilities required to successfully install and integrate the new electrical equipment. All modifications to existing equipment, panels, or cabinets shall be made in a professional manner with all coatings repaired to match existing. Modifications to existing electrical facilities required for a complete and operating system shall be made at no additional cost to the City. Extreme caution shall be exercised in digging trenches in order not to damage existing underground utilities. Cost of repairs of damages caused during construction shall be the Contractor's responsibility.
2. The Contractor shall verify all available existing circuit breakers in lighting panels for their intended use as required by the drawings. At no additional cost to the City, the Contractor shall verify the available space in substation switchboards to integrate new power circuit breakers.

PART 2 – PRODUCTS (Not Used)

PART 3 -- EXECUTION

3.1 EXAMINATION

- A. The Contractor shall verify equipment locations and delivery routes prior to installation to ensure the equipment will fit in the available space. The drawings do not indicate exact scale or dimension.
- B. Existing raceways that contain space to run wiring may be used where indicated on the

drawings. Do not damage existing equipment or wiring. Do not interrupt control or monitoring signals or power. The Contractor shall obtain prior approval from the Resident Engineer before pulling wires.

3.2 INSTALLATION

- A. The Contractor shall provide temporary installations adjacent to existing equipment where noted.
- B. After modifying existing equipment, the Contractor shall dismantle temporary installations and restore to original condition.
- C. Perform work neatly. The Contractor shall keep sites clean of accumulation of cartons, trash and debris. Remove trash and debris daily. Vacuum clean cabinets, panels and enclosures installed or modified.
- D. The Contractor shall route and locate equipment items so as not to obstruct access to equipment, personnel walkways, or expose it to potential mechanical damage.
- E. Install items straight and plumb. The Contractor shall exercise care so that like items are mounted the same position, heights and general location. Securely anchor and fasten items.
- F. The Contractor shall locate and install electrical devices to afford maximum safety to personnel making adjustments, manual operations, or replacement of these devices. Locate items to permit them being reached without the use of ladders or without climbing or crawling over or under obstacles such as motors, pumps, piping, and ductwork.
- G. The Contractor shall use bushings for entrances to existing panels, cabinets, or enclosures through drilling and knock-outs.
- H. The Contractor shall tag wires with foreign voltages to indicate source of power.

3.3 GENERAL

- A. The Contractor shall install electrical equipment and material of the size, type, and general routing as shown on the drawings.
- B. The Contractor shall install metallic raceway, fittings, boxes, and cabinets free from direct contact with reinforcing steel.
- C. The Contractor shall provide fasteners, anchor bolts, anchorage items and supports as required for rigid alignment and sized according to size and weight of equipment and thickness of supporting surfaces.
- D. Where aluminum is placed in contact with dissimilar metal or concrete, the Contractor shall separate contact surfaces with gasket, non-absorptive tape, or coating to prevent corrosion.
- E. The Contractor shall make metallic conduit, raceways, and cable trays electrically and

mechanically continuous and ground as required. Conduits shall be continuous between outlets, boxes, cabinets, and panels, and shall enter and be secured to each box.

- F. A ground conductor shall be provided in each raceway run.
- G. Not more than one 3-phase circuit or feeder shall be installed in a conduit run.

3.4 TESTING

- A. The Contractor shall perform field-testing to demonstrate correct installation and operation of equipment.
- B. Upon completion of work, the Contractor shall test the electrical system for shorts and grounds and proper phasing. The Engineer will observe the testing.

3.5 CLEANING

- A. Touch up paint surfaces marred during installation. The Contractor shall submit color samples prior to painting. Remove foreign paint from exterior and touch up scratches with same paint as original. Sand, prime, and repaint rusted areas.
- B. Clean and lubricate relay contacts, pushbutton and other control devices installed or modified. Lubricate with CRC 2-26 or other lubricant or cleaning agent specifically designed for this purpose.
- C. At completion of work in any area, the Contractor shall remove all debris and unused materials and equipment and leave all areas broom clean. Where work in carpeted areas results in visible soiling of carpets, clean the affected carpets and restore them to the original condition.

3.6 PROTECTION

- A. The Contractor shall maintain site security.
 - 1. Verify that all cabinets, doors, and gates that were opened during the day are locked when leaving.
 - 2. Do not leave unlocked cabinets unattended.

****END OF SECTION****

SECTION 16110

RACEWAYS

PART 1 -- GENERAL

1.1 SUMMARY

A. The section describes the requirements for raceways including the following:

1. Conduit
2. Fittings
3. Miscellaneous Specialty Fittings
4. Raceway Supports
5. Underground Ducts and Manholes
6. Outlet, Junction, and Pull Boxes
7. Wiring Devices
8. Terminal Cabinets
9. Sealants

B. Reference is made to the following related sections:

1. Conduit identification per Section 16195 - Electrical Identification.
2. Conduit support per Section 16190-Supporting Devices

1.2 SUBMITTALS

- A. See Section 16010 for general submittal requirements for Division 16.

1.3 SYSTEM DESCRIPTION

- A. Size conduit in accordance with the National Electrical Code, but galvanized rigid steel (GRS) conduit shall be no smaller than 3/4 inch and schedule 40 PVC conduit shall be no smaller than 1 inch. Use larger sizes if shown.
- B. Use fittings of the same material and match the raceway.
- C. PVC coated galvanized rigid steel conduit (GRS) shall be used in all exposed and/or above grade locations and within underground vault structures and for all signal wiring. Schedule 40 PVC shall be used for direct buried or concrete encased underground locations for power and control wiring, concrete encased. 24 Vdc discrete and analog signals may occupy the same conduit.

PART 2 -- PRODUCTS

2.1 CONDUIT

- A. General: Raceway shall be manufactured in accordance with UL and ANSI standards and shall bear UL label as applicable.
- B. Galvanized Rigid Steel (GRS) Conduit:
 - 1. Rigid steel conduits and fittings shall be full weight, mild steel, hot-dip galvanized and zinc bichromate coated inside and outside after galvanizing.
 - 2. Each piece of conduit shall be straight, free from blisters and other defects, cut square and taper reamed. Furnish in 10 foot lengths minimum, threaded at each end. Provide couplings at one end and a protective sleeve for the other end.
 - 3. Rigid steel conduit shall be manufactured in accordance with UL Standard No. 6 and ANSI C80.1.
 - 4. Rigid steel conduit shall be manufactured by Triangle PWC, Republic Steel, or equal.

C. Rigid Nonmetallic Conduit: Rigid nonmetallic conduit shall be Schedule 40 PVC.

1. Nonmetallic conduits and fittings shall be UL listed, sunlight-resistant, and rated for use with 90 degrees C conductors.
2. Use expansion joints as recommended by the manufacturer.
3. Nonmetallic conduits and fittings shall be manufactured by Carlon, Condux, or equal.

D. Flexible Metallic Conduit: Liquid-tight flexible metallic conduit shall have an extruded PVC covering over the flexible steel conduit. Conduit shall be approved for grounding. For conduit sizes 3/4 inch through 1-1/4 inches, flexible conduits shall have continuous built-in copper ground conductor. Flexible conduit shall be American Brass, Anaconda, Electroflex, or equal. Explosion-proof flexible conduits shall be used for Class I, Div. 1, Group C&D areas.

E. PVC coated GRS shall be 40 mil coating. Robroy, OCAL, or approved equal.

2.2 FITTINGS

- A. General: Fittings shall comply with the same requirements as the conduit with which they will be used. Fittings having a volume less than 100 cubic inches for use with rigid steel conduit, shall be cast or malleable nonferrous metal. Such fittings larger than one inch shall be "mogul size." Fittings shall be of the gland ring compression type. Use threaded connectors for all rigid metal conduits. Covers of fittings, unless in "dry" locations, shall be closed with gaskets. Surface-mounted cast fittings, housing wiring devices in outdoor and damp locations, shall have mounting lugs.
- B. Insulated Bushings: Insulated bushings shall be molded plastic or malleable iron with insulating ring, similar to O-Z Type A and B, equivalent types by Thomas & Betts, Steel City, Appleton, O-Z/Gedney, or equal.
- C. Insulated Grounding Bushings: Insulated grounding bushings shall be malleable iron with insulating ring and with ground
- D. Erickson Couplings: Erickson couplings shall be used at all points of union between ends of rigid steel conduits which cannot be coupled. Running threads and threadless couplings shall not be used. Couplings shall be 3-piece type such as Appleton Type EC, equivalent types such as manufactured by T & B, Steel City, O-Z/Gedney, or equal.

- E. Liquid-Tight Fittings: Liquid-tight fittings shall be similar to Appleton Type ST, equivalent types such as manufactured by Crouse-Hinds, T & B, O-Z/Gedney, or equal.
- F. Hubs: Hubs for threaded attachment of steel conduit to sheet metal enclosures, where required, shall be similar to Appleton Type HUB, equivalent types such as manufactured by T & B, Myers Scrutite, or equal.
- G. Transition Fittings: Transition fittings to mate steel to PVC conduit, and PVC access fitting, shall be as furnished or recommended by the manufacturer of the PVC conduit.
- H. Sealed Fittings: Sealing fittings are required in conduit runs entering corrosive areas and elsewhere as shown. Sealing fittings shall be Appleton Type EYS, O-Z Type FSK, or equal. Sealing compound shall not be poured in place until electrical installation has been otherwise accepted.
- I. Expansion Fittings: Expansion fittings shall be installed wherever a raceway crosses a structural expansion joint. Such fittings shall be expansion and deflection type and shall accommodate lateral and transverse movement. Fittings shall be O-Z/Gedney Type "DX," Crouse Hinds "XD," or equal. These fittings are required in metallic and nonmetallic raceway installations. When the installation is in a nonmetallic run, a 3-foot length of rigid conduit shall be used to connect the nonmetallic conduit to the fitting.

2.3 MISCELLANEOUS SPECIALTY FITTINGS

- A. Provide conduit thru-wall seals where conduits pass through exterior concrete or masonry walls below grade. The seals shall consist of a hot dip galvanized steel sealing gland assembly capable of providing a seal around the conduit to withstand 50 feet of water head without leakage. The shell of the seal shall have at least two cast collars at a right angle to the sleeve that is embedded in the concrete. For new structures, provide O-Z/Gedney type WSK, or equal. For cored hole applications in existing structures, provide O-Z/Gedney type CSM, or equal.

2.4 RACEWAY SUPPORTS

See section 16190 for raceway support.

2.5 UNDERGROUND DUCTS AND MANHOLES

- A. General: Where an underground distribution system is required, it shall be comprised of multiple runs of single bore nonmetallic ducts, concrete encased, with steel reinforcing bars, with underground manholes and pullboxes. They shall be rigid Schedule 40 PVC for concrete encasement.

1. Manholes and pullboxes shall be of precast concrete. Concrete construction shall be designed for traffic loading.

Covers shall be traffic type, except as shown otherwise. Manholes and pullbox covers designated as "HV" covers shall be identified as "High Voltage Electric," "P" shall be identified as "Secondary Electric," "C" as "Control" and "S" as "Signal." All covers shall be watertight after installation.

Manholes and pullboxes shall be equipped with pulling-in irons opposite and below each ductway entrance.

Manholes shall have concrete covers with 30-inch diameters lids. All covers and lids shall be bolted to cast-in-place frames with corrosion resistant hardware. Frames shall be factory-primed; covers shall be cast-iron and shall have pick holes.

2. Manholes and pullboxes shall have cable supports so that each cable is supported at 3-foot intervals within the manhole or pullbox. Cable supports and racks shall be fastened with galvanized bolts and shall be fabricated of fiberglass or galvanized steel. Porcelain insulators for cable racks shall be provided.
3. Manholes and pullboxes shall be Brooks, Quikset, U.S. Precast, or equal. Cast-iron covers shall be by U.S. Foundry, or equal.

2.6 OUTLET, JUNCTION, AND PULL BOXES

- A. General: Outlet, switch, pull and junction boxes for flush-mounting in general purpose locations shall be one-piece, galvanized, pressed steel. Ceiling boxes for flush-mounting in concrete shall be galvanized, pressed steel.
- B. Corrosive Locations: The entire project site shall be considered a corrosive location. Control station, pull and junction boxes, including covers, for installation in corrosive locations shall meet the NEMA 4X requirements and shall be stainless steel and shall be furnished with mounting lugs.

2.7 TERMINAL CABINETS

- A. Provide terminal cabinets as suitable for flush or surface mounting, dry or wet locations, as indicated on the Drawings. Cabinets shall meet the following additional requirements:
 1. Continuous piano hinged door(s) and back panel to mount terminal blocks.

Cabinet boxes shall be constructed of 316 Stainless Steel.

3. Cabinet trims constructed of sheet steel in accordance with UL standards. Trims for surface mounted panels shall be provided with factory applied prime and finish coats of paint. Trims for flush mounted cabinets shall be provided with factory applied prime coat of paint suitable for field application of finish paint, except as otherwise noted.
4. Non-metallic or aluminum backboards.
5. 18 inches in width, 24 inches in height, and 4 inches in depth unless shown otherwise on the Drawings.
6. Provide a minimum of 12 terminals in each cabinet. Provide 25% spare terminals. Terminals shall be Marathon No. 1600, Buchanan No. 218, or equal.

2.8 SEALANTS

- A. Provide non-hardening, UL approved type for wall penetrations and underground ductbank seals.
- B. Provide hard setting, UL approved type for hazardous location seal fittings.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Raceways shall be installed as indicated, however, conduit routings shown are diagrammatic. The Contractor shall check location of equipment connections before installing raceways and locate and arrange raceways accordingly. Raceway systems shall be electrically and mechanically complete before conductors are installed. Bends and offsets shall be smooth and symmetrical, and shall be accomplished with tools designed for the purpose intended. Factory elbows shall be used for all 3/4-inch conduit. Bends in larger sizes of metallic conduit shall be accomplished by field bending or by the use of factory elbows. All installations shall be in accordance with the latest edition of the NEC.
- B. Raceways shall be installed in accordance with the following schedule:
 1. Low Voltage Raceway (control, power, data and communications):

- a. Rigid Schedule 40 PVC shall be used for concrete encased duct in earth.
 - b. PVC coated GRS conduit and fittings shall be used in vaults and all exposed, above ground locations.
2. Analog Signal Raceways:
 - a. Galvanized rigid steel conduits shall be used for concrete encased duct on earth.
 - b. PVC coated galvanized rigid steel conduits shall be used on exposed installations in general purpose areas.
 - c. PVC coated galvanized rigid steel shall be used on exposed installations in outdoor areas.
- C. Exposed Raceways:
 1. Conduits shall be rigidly supported with clamps, hangers, and Unistrut channels or approved equal.
 2. Intervals between supports shall be in accordance with the National Electric Code.
- D. Conduit Terminations: Empty conduit terminations not in manholes or pullboxes shall be plugged. Exposed raceway shall be installed perpendicular or parallel to buildings except where otherwise indicated. Conduit shall be terminated with flush couplings at exposed concrete surfaces. Conduit stubbed up for floor-standing equipment shall be placed in accordance with approved shop drawings. Metallic raceways installed below-grade or in outdoor locations and in concrete shall be made up with a conductive waterproof compound applied to threaded joints. Compound shall be Zinc Clads Primer Coatings No. B69A45, HTL-4 by Crouse-Hinds, Kopr Shield by Thomas & Betts, or equal.
- E. Install metallic raceway, fittings, boxes, and cabinets free from direct contact with reinforcing steel.
- F. Provide fasteners, anchor bolts, anchorage items and supports as required for rigid alignment and sized according to size and weight of equipment and thickness of supporting surfaces.
- G. Make metallic conduit, raceways, and cable trays electrically and mechanically continuous and ground as required. Conduits shall be continuous between outlets, boxes, cabinets, and panels, and shall enter and be secured to each box.

- H. Provide ground conductor in each raceway run.

3.2 CONDUIT INSTALLATION

- A. Conduit may be cast integral with horizontal and vertical concrete slabs, providing one-inch clearance is maintained between conduit surface and concrete surface. If said clearance cannot be maintained, the conduit shall be installed exposed below elevated slabs; provided, that in the case of slabs on grade, conduit shall be installed below the slab. Maximum size of conduit that can be cast in slab shall be 1-1/2 inches.
- B. Nonmetallic conduit may be cast integral with horizontal slabs with placement criteria stated above. Non-metallic conduit may be run beneath structures or slabs on grade, without concrete encasement. In these instances conduit shall be placed at least 12 inches below the bottom of the structure or slab. Nonmetallic conduit may be buried 24 inches minimum below grade, with a 3-inch concrete cover, in open areas or where otherwise not protected by concrete slab or structures. Top of concrete cover shall be colored red. Nonmetallic conduit shall be permitted only as required by the Specifications and in concealed locations as described above.
- C. Where a run of concealed PVC conduit becomes exposed, a transition to rigid steel conduit is required. Such transition shall be accomplished by means of a factory elbow or a minimum 3-foot length of PVC coated rigid steel conduit, either terminating at the exposed concrete surface with a flush coupling. Piercing of concrete walls by nonmetallic runs shall be accomplished by means of a short steel nipple terminating with flush couplings.
- D. Flexible conduit shall be used at dry locations for the connection of equipment such as motors, transformers, instruments, valves, or pressure switches subject to vibration or movement during normal operation or servicing. Flexible conduit may be used in lengths required for the connection of recessed lighting fixtures; otherwise the maximum length of flexible conduit shall be 18 inches.
- E. In other than dry locations, connections shall be made using flexible liquid-tight conduit. Equipment subject to vibration or movement which is normally provided with wiring leads, such as solenoid valves, shall be installed with a cast junction box for the make-up of connections. Flexible conduits shall be as manufactured by American Brass, Cablec, Electroflex, or equal.
- F. Galvanized Rigid Steel Conduit (GRS): Treat field cut threads with a liquid galvanized solution or a conductive rust inhibitor that will maintain ground continuity before installing locknuts, bushings, or other fittings. Where required use UL approve conduit unions. Do not use split couplings or running threads in lieu of unions.

- G. Flexible Metallic Conduit (liquid tight): Use only for terminations to vibrating or moving equipment such as motors or transformers. Connectors shall be liquid tight, stainless steel, or bronze with insulated throats.

- H. Rigid nonmetallic conduit: All exposed bends shall use rigid steel conduit. All risers shall use rigid steel conduit. Do not use PVC conduit for routing of analog or communication signal circuits.

- I. Earth Buried Conduits
 - 1. For conduits buried in earth provide minimum 30 inches of cover and minimum of one foot clearance between other utility crossings and parallel runs. Maintain a grade of at least four inches per 100 feet either from one manhole or pull box to the next or from a high point between them. Drain conduits away from building, if not possible provide watertight seal at building.
 - 2. Provide detectable warning tape approximately 18 inches above and directly over centerline of buried conduit.

- J. Conduit Damage Correction Repair cuts, nicks, and abrasions or replace damaged conduit as directed.

- K. Conduit Penetrations
 - 1. Seal all raceways entering structures at the first box or outlet with oakum or suitable plastic expandable compound to prevent the entrance into the structure of gases, liquids, or rodents.
 - 2. Dry pack with nonshrink grout around raceways that penetrate concrete walls, floors, or ceilings aboveground, or use one of the methods indicated for underground penetrations.
 - 3. Where an underground conduit enters a structure through a concrete roof or a membrane waterproofed wall or floor, provide an acceptable, malleable iron, watertight, entrance sealing device. When there is no raceway concrete encasement, provide such device having a gland type sealing assembly at each end with pressure bushings that may be tightened at any time. When there is raceway concrete encasement indicated, provide such a device with a gland type sealing assembly on the accessible side. Securely anchor all such devices into the masonry construction with one or more integral flanges. Secure membrane waterproofing to such devices in a permanently watertight manner.
 - 4. Where an underground raceway without concrete encasement enters a structure through a nonwaterproofed wall or floor, install a sleeve made of Schedule 40 galvanized pipe. Fill the space between the conduit and sleeve with a suitable

plastic expandable compound, or an oakum and lead joint, on each side of the wall or floor in such a manner as to prevent entrance of moisture. A watertight entrance sealing device may be used in lieu of the sleeve.

5. Make concealed penetrations for conduits not more than 1/4 inch larger than the diameter of the conduit. Make penetrations through walls, ceiling, and floors other than concrete for exposed conduits not more than 1/4 inch larger than the diameter of the conduit. Fill void around conduit with caulking compound and finish surface same as wall, ceiling, or floor.
6. Where a conduit enters through a concrete non-waterproofed wall, floor, or ceiling, provide a galvanized steel sleeve, Schedule 80, and fill the space between the conduit and sleeve with plastic expandable compound or an oakum and lead joint. If the sleeve is not placed with the concrete, drill hole not less than 1/2-inch or more than one inch larger than sleeve, center sleeve, and grout sleeve total depth of penetrated concrete with non-shrink grout, polyurethane, or silicone sealant.
7. Where conduits penetrate walls, install junction box on other side of penetration. Separate 120 Vac boxes from low, dc voltage circuits.

3.3 UNDERGROUND DUCTS AND MANHOLES INSTALLATION

A. Duct Bank Installation: The underground concrete encased duct bank shall be installed in accordance with the criteria below:

1. Duct shall be assembled using high impact nonmetallic spacers and saddles to provide conduits with vertical and horizontal separation. Plastic spacers shall be set every 5 feet.
2. The duct shall be laid on a grade line of at least 4 inches per 100 feet, sloping towards pullboxes or manholes. Duct shall be installed and pullbox and manhole depths adjusted so that the top of the concrete envelope is a minimum of 24 inches below grade.
3. Changes in direction of the duct envelope by more than 10 degrees horizontally or vertically shall be accomplished using bends with a minimum radius 24 times the duct diameter.
4. Couplings shall be staggered at least 6 inches vertically. Bottom of trench shall be of select backfill or sand. The duct array shall be anchored every 4 feet to prevent movement during placement of the concrete envelope.
5. Each bore of the completed duct bank shall be cleaned by drawing through it a

standard flexible mandrel one foot long and 1/4-inch smaller than the nominal size of the duct through which the mandrel will be drawn. After passing of the mandrel, draw a wire brush and swab through.

6. A raceway, in the duct envelope, which does not require conductors, shall have a 1/8-inch polypropylene pull cord installed throughout the entire length of the raceway.
- B. Duct Entrances: Duct entrances shall be grouted smooth; duct for primary and secondary cables shall be terminated with flush end bells. Sections of pre-fabricated manholes and pullboxes shall be assembled with waterproof mastic and shall be set on a bed of gravel as recommended by the manufacturer or as required by field conditions.
- C. Duct Bank Markers: Duct bank markers shall be installed every 200 feet along run of duct bank, at changes in horizontal direction of duct bank, and at ends of duct bank. Concrete markers, 6 by 6 inches square and one foot long, shall be set 2 inches above finish grade. The letter "D" and arrow set in the concrete shall be facing in the direction of the duct alignment.
- D. Watertight Penetrations: Duct bank penetration through walls of manholes or pullboxes, and on building walls below grade shall be watertight.
- E. Trench Backfill: Trenches containing duct banks shall be filled with select backfill with no large rocks which could damage the duct.
- F. Concrete Encased Duct Banks: Concrete encased duct bank shall terminate at building foundations. When duct enters the building on a concrete slab on grade, duct shall not be encased, but shall transition to rigid steel PVC-coated conduits on all stub-ups.

3.4 TERMINAL CABINETS INSTALLATION

- A. Provide terminal cabinets where shown on the Drawings and in accessible locations with working space in front of and around the installation.
- B. Cabinets shall be set plumb at an elevation that will cause the maximum circuit breaker height to be less than 66 inches above grade. Top edge of trim of adjacent panels shall be at the same height. Panels which are indicated as flush mounted shall be set so cabinet is flushed and serves as a "ground" for plaster application.
- C. All factory wire connections shall be made at shipping splits, and all field wiring and grounding connections shall be made after the assemblies are anchored.
- D. Identify each circuit and conductor.

- E. Provide terminals and connectors to match the cable being terminated.

3.5 OUTLET, JUNCTION, AND PULL BOXES INSTALLATION

- A. For boxes mounted on steel, concrete, and masonry surfaces provide minimum ¼-inch spacer to hold box away from surface.
- B. Sizing: Pull and junction boxes shall be sized in accordance with the requirements of the NEC.
- C. Outlet Boxes: Outlet boxes shall be used as junction boxes wherever possible. Where separate pullboxes are required, they shall have screw covers.
- D. Requirements: Pullboxes shall be installed when conduit run contains more than three 90-degree bends and runs exceed 200 feet.
- E. Opening in terminal panels, outlet and junction boxes shall be by means of welded bosses, standard knockouts, or shall be sawed, drilled, or punched with tools specially made for the purpose. The use of a cutting torch is prohibited. Unused openings shall be plugged per the NEC.
- F. Remove debris including dust, dirt, wire clippings and insulation from interior of boxes. Replace damaged boxes or boxes with open circuit holes.
- G. Where boxes are shown on each side of a common wall do not mount back-to-back but offset horizontally minimum of six inches.
- H. For wet or damp indoor or outdoor locations use boxes of rust and corrosion resistant NEMA 4X, with at least 5 1/2 full threads for each (bossed) conduit opening. Boxes to be suitable for flush or surface mounting as required with drilled external, cast mounting extensions (bossed to provide at least 1/8" between back of box and mounting surface for drainage). Box covers shall be hinged or cap screw retained as required, of the same material as the box and provided with stainless steel (rust proof) hardware. Indoor location may use boxes constructed of stainless steel or non-metallic. Outdoor boxes shall be stainless steel.
- I. For underground locations use boxes constructed of reinforced concrete cast-in-place or pre-fabricated as shown on the Drawings.

****END OF SECTION****

SECTION 16120

WIRES AND CABLES

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes requirements for power, control, and instrumentation wiring including the following:
 - 1. 600 volt and below power cable.
 - 2. 600 volt and below control cable.
 - 3. Shielded signal instrument cable.
 - 4. Wire terminations, splices, and Connectors.
- B. Reference is made to the following related sections:
 - 1. Conductor identification per Section 16195 - Electrical Identification.
 - 2. Installation in raceways per Section 16110 - Raceways.

1.2 SUBMITTAL

- A. In addition to the general submittal requirement in section 16010, include the following in the submittal for this section:
 - 1. Twelve-inch length of wire and cable with tag from coils or reel from which samples are taken. The sample shall show manufacturer, coil or reel number from which sample was taken, insulation type and ratings, conductor AWG, and voltage class of cable.
 - 2. Cable test procedures and methods.
 - 3. Cable test results and certification.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver wire and cable in unbroken package or reels that bear the manufacturer name, the dates of manufacture, wire size, and wire type.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. All conductors, including ground conductors, shall be copper. Insulation shall bear UL label and the manufacturer's trademark, type, voltage, and temperature rating, and

conductor size. Wire and cable shall be the products of American, Rome Cable, Okonite, Houston Wire and Cable, or equal.

- B. Provide lightning and transient surge protection on each end of the radio coax cable.

2.2 MATERIALS

- A. **Single Conductor Power Cable.** Single conductor power cable shall be 12 AWG minimum. Conductors shall be copper, stranded, 600-volt, THHN/THWN -insulation, and shall be UL listed.
- B. **Single conductor Control Cable.** Single conductor control cable shall be 14 AWG minimum. Conductors shall be copper, stranded, with 600-volt, THHN/THWN insulation, and shall be UL listed.
- C. **Multiconductor Control Cable.** Multiconductor control cable shall be 14 AWG with copper conductors 600 volt, THHN/THWN insulation, and overall PVC jacket applied over tape wrapped cable core. Cable shall be rated type TC and shall be UL listed. Cable shall be rated 90 C dry, 75 C wet. Conductors shall be identified per ICEA S-61-402 Appendix K, Method 1 or Method 3. White or green conductors shall not be provided.
- D. **Single Shielded Pair or Triad.** Conductors shall be 16 AWG minimum. Cable shall have 300 volt insulation. Wires shall have uniform twists with a minimum of 6 twists per foot. Each pair or triad shall be provided with a continuous foil or metalized plastic shield providing 100 percent coverage. Each pair or triad shall contain a tinned copper drain wire in continuous contact with the shield. Each pair shall have a black and white wire, each triad shall have a black, white, and red wire. Insulated conductors shall meet the requirements of UL 62 for type TFN. Assembly jacket shall meet the requirements of UL 1277. Cable shall meet the vertical flame test requirements of UL 1277 and shall be rated type TC and shall be UL listed.
- E. **Multiconductor shielded pair or triad.** Conductors shall be 18 AWG minimum. Wires shall have uniform twists with a minimum of 6 twists per foot. Each pair or triad and cable assembly shall be provided with a continuous foil or metalized plastic shield providing 100 percent coverage and total shield isolation from all other pair or triad shields. Each pair shall have a black and white wire, each triad shall have a black, white, and red wire. Each pair or triad shall contain a tinned copper drain wire in continuous contact with the shield. Insulated conductors shall meet the requirements of UL 62 for type TFN. Assembly jacket shall meet the requirements of UL 1277. Cable shall meet the vertical flame test requirements of UL 1277 and shall be rated type TC and shall be UL listed.
- F. **Ground Cable.** All ground cable shall be in conformance with specification section 16450-Grounding. Ground cables shall be bare or green insulated, copper, 12 AWG minimum. Insulated cable shall meet the requirements for Single Conductor Power Cable above.
- G. The same manufacturer shall manufacture each type of cable listed above, multiple manufacturers for the same type of cable shall not be allowed.

2.3 COLOR CODING

- A. Provide color coding throughout the entire network for service, feeder, branch, control, and low energy signal circuit conductors. Color coding of conductors 10 AWG and smaller shall have factory impregnated color throughout its entire length. Conductors No. 8 AWG and larger gauge may be marked with color coding tape a minimum of 0.004 inch in thickness. Color shall be green for grounding conductors, and white or gray for neutrals. The color of conductors for different voltage systems shall be as follows:

SYSTEM	PHASE A	PHASE B	PHASE C	NEUTRAL	GROUND
120/240 one phase	black	red	---	white	green
208/120 three phase	black	red	blue	white	green
480/277 three phase	brown	orange	yellow	gray	green
Control and low energy	red	---	---	white	green

2.4 WIRE CONNECTIONS AND CONNECTING DEVICES

A. Electrical Terminal and Splice Connectors

1. The splicing of conductors is not permitted. Provide continuous conductor runs.
2. For terminating conductors from #22 through #10 AWG use compression type connectors with barrels and locking spade type terminals. Conductor entry and crimp area shall be insulated with PVC insulation. Performance, construction, and materials shall be in conformance with UL standards for wire connectors and rated for 600 volts and 105 degrees Celsius. Connectors shall be manufactured from high conductivity copper and entirely tin-plated. Terminal barrels shall be brazed seam or seamless construction serrated on the inside surface and have a chamfered funnel entry to prevent strand fold-back.
3. For terminating conductors #8 AWG and larger use high pressure compression type or set screw type lugs. Lugs shall be manufactured from high conductivity copper and entirely tin plated with a current carrying capacity equal to the conductors for which they are rated and must also meet UL requirements. All lugs above 4/0 AWG shall be 2 hole lugs with NEMA spacing, rated for operation through 35 kV, and be of closed end construction to exclude moisture migration into the cable conductor.
4. Use solderless/re-usable lugs only when furnished with equipment such as control panels, furnished by others, where specification of compression type lugs is beyond the Contractor's control. Lugs must be manufactured to NEMA standards, with standard number and spacing of holes and set screws. Coat wires with electrical joint compound, T & B Kopr-Shield, Penn-Union Coal-Aid, or equal before being bolted into the connector.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Run all wires and cables in raceways unless otherwise noted.
- B. Conductors shall not be pulled into raceway until:
 - 1. Raceway system is complete and has been inspected and accepted by the Engineer.
 - 2. Plastering and concrete have been completed in affected areas.
 - 3. Raceway system has been freed of moisture and debris.
- C. Wire in panels, cabinets, and gutters shall be neatly grouped using nylon tie straps and shall be fanned out to terminate.
- D. For multiconductor or manufactures supplied cable not installed in raceways, terminate cable sheaths in watertight connectors designed for the specific cable and application.
- E. Conductors of No. 1 size and smaller shall be hand pulled. Pull conductors without exceeding manufacturer's recommendation for maximum pulling tension. Protect conductor insulation jacket at all times from kinks, scrapes, punctures, and other damage. Replace damaged conductors. Use lubricating compound to reduce pulling force. Use lubricating compound that is UL listed and compatible with the conductor- insulated jacket and with the raceway. The use of petroleum or grease based lubricants is prohibited.
- F. Support conductors in vertical risers with woven grips to prevent loading on conductor connectors.
- G. In conduits entering buildings or from areas where temperature change may cause condensation or moisture, seal between conductors and conduit after conductors are in place.
- H. When using color-coding tape apply with overlapping turns for a minimum length of two inches starting two inches back from the termination point.
- I. Provide full-length ground conductor in all conduits.
- J. Leave a minimum of six inches of free conductor at each connected outlet and a minimum of nine inches at unconnected outlets.

3.2 APPLICATION AND USE OF DIFFERENT CABLE TYPES

- A. **Single Conductor Power Cable.** Single conductor power cable shall be used for all ac power feeders and branch circuits.
- B. **Single Conductor Control Cable.** Single conductor or multiconductor control cable can be used interchangeably for all discrete control signals.
- C. **Multiconductor Control Cable.** Single conductor or multiconductor control cable can

be used interchangeably for all discrete control signals.

- D. **Single Shielded Pair or Triad.** Single shielded pair or triad conductors or multiconductor shielded cables can be used interchangeably on analog signal lines of less than 24 volts.
- E. **Multiconductor shielded pair or triad.** Single shielded pair or triad conductors or multiconductor shielded cables can be used interchangeably on analog signal lines of less than 24 volts.
- F. **Ground Cable.** Use ground cable for all equipment ground and earth ground connections.

3.3 SPLICING AND TERMINATION

- A. Make all splices in pull or junction boxes or other approved enclosure. Do not pull splices into conduit. Keep splices to a minimum and in no case more frequent than 300 feet. Insulate all splices to protect conductors from entry of moisture and or contaminants and to provide insulation levels equal to the conductor insulation.
- B. Make all wire and cable terminations in UL approved lugs for the application.
- C. Connect circuit conductors of the same color to the same phase throughout the installation.
- D. Insulate connections/splices with a smooth even contour with a conformable 7 mil thick vinyl plastic insulating tape which can be applied under all weather conditions and is designed to perform in a continuous temperate environment up to 105 degrees Celsius. Use tape with resistance to abrasion, moisture, alkali's, acids, corrosion, and varying weather conditions (including sunlight) equal to Scotch 33+. Apply tape in conformance with manufacturer's recommendations and in addition, in successive half-lapped layers with sufficient tension to reduce its width to 5/8 of its original width. Do not stretch the last inch of wrap.
- E. First wrap connections or splices with irregular shapes or sharp edges protruding with 30 mil rubber tape to smooth the contour of the joint before being insulated with 33+ insulating tape specified in the previous paragraph.
 - 1. Apply the rubber tape in successive, half-lapped wound layers, highly elongated to eliminate voids, and in accordance with other manufacturer's recommendations on installation.
 - 2. Use rubber tape which is high voltage (69 kV) corona-resistant based on self-fusing ethylene propylene rubber and capable of operation at 130 degrees Celsius under emergency conditions. The tape must be capable of being applied in either the stretched or unstretched condition without any loss in either physical or electrical properties. The tape must not split, crack, slip, or flag when exposed to various environments. The tape must be compatible with all synthetic cable insulation. The tape must have a dissipation factor of less than 5 percent at 130 degrees Celsius, be non-vulcanizing, and have a shelf life of at least 5 years. The rubber tape shall be equal to Scotch 23 or 130C electrical splicing tape.

- F. Make splices made in wet or damp locations or below grade with watertight with special kits made for the application and compatible with types of cables employed.
- G. Make connections to lugs and bus bars, with corrosion resistant stainless steel bolts having non-magnetic properties with matching nuts, and a Belleville spring washer (stainless steel) to maintain connection integrity. Torque connections to the specified limits. Prior to bolting up the connection, brush electrical joint compound on the contact faces of the electrical joint.

3.4 SEPARATION OF CONDUCTORS

- A. Ensure that analog signals in one cable or conduit are of the same magnitude. The following are the different signal magnitudes:
 - 1. 0 to 100 mV
 - 2. 101 mV to 5 V
 - 3. 6 V to 75 V
- B. Run 24 Vdc discrete and analog signals in separate conduits from 115 Vac discrete signals and wiring.
- C. Neatly arrange wiring with terminations located directly opposite terminals. Leave wire loops not less than 6 inches long in each outlet box. Tape frayed terminals and exposed wires.

3.5 SPARE WIRES

- A. Notify the Engineer of any instance in which the spare conductor quantity cannot be installed. Tape off all spare conductors in the originating field junction boxes. Terminate and label in terminal boxes. Include all spare wires in conduit and wire schedules.

3.6 TESTING

- A. Cable assembly and testing shall comply with applicable requirement ICEA Publication No. S-68-516 and other relevant ICEA publications. Field tests shall be performed by a certified test organization acceptable to the cable manufacturer.
- B. All wiring shall be tested for continuity, polarity, undesirable ground, and origination. Test wiring for continuity using an ohmmeter. Replace any conductor or cable where the measured resistance exceeds the calculated resistance based on conductor size and length by more than 5 % unless otherwise directed by the engineer.
- C. Before terminating conductors test all conductors between phases and phase to ground for grounds and leakage between individual conductors using a megger capable of producing voltages of at least 500 volts for 300 volt insulation levels and 1000 volts for 600 volt insulation levels. If any conductor tested indicates resistance between conductors or between the conductor and ground of less than 10 megohms, replace the failed wire or cable unless otherwise directed by the engineer.

- D. Cables failing in the test will be replaced with new cable or repaired. Such kind of repair methods shall be as recommended by the cable manufacturer and shall be performed by persons qualified by the industry.
- E. Submit test results to the Engineer and certify all conductors have passed the required tests. Correct problems noted during these tests.

****END OF SECTION****

SECTION 16190
SUPPORTING DEVICES

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes the requirements of supporting devices for equipment, antennas, conduit, and cables.
- B. A registered Civil Engineer in the State of California is required to prepare calculation that show equipment anchorage and support structure requirements will comply with the UBC (latest edition), City Seismic requirements, and wind loading requirements for antenna masts.

1.2 SUBMITTALS

- A. Include the following information for each site in the submittal for this section:
 - 1. Shop drawings of parts and assembly.
 - 2. Descriptive data sheets, literature, bulletins, and related data annotated as necessary to describe the antenna tower or pole and related equipment to be furnished.
 - 3. Wind Zone information.
 - 4. Specific arrangement, dimension drawings, erection and assembly drawings for the antenna tower or pole supplied. This shall include all engineering drawings and calculations for the antenna tower or pole, pier foundation, anchor bolts, etc., as prepared by a registered Professional Engineer.

1.3 SITE CONDITIONS

- A. Determine to your own satisfaction the location and nature of all surface and subsurface obstacles and the soils and water conditions which will be encountered during the construction.

PART 2 -- PRODUCTS

2.1 MATERIALS

- A. Do not use expansive screw anchors, shields, or other fastening items containing lead or other material that might loosen or melt under fire conditions. Do not use power-actuated fasteners and devices.
- B. Equipment or enclosure support devices.
 - 1. Mounting brackets and support channels shall be stainless steel, unless otherwise specified on the drawings. Fasteners used to mount equipment outdoors shall be stainless steel and designed for use with the support channels.

2. Provide supporting devices manufactured by Unistrut, Bee-Line, Kindorf, or equal.
- C. Raceway Supports
1. Except as noted herein, supports and hangers shall be stainless steel.
 2. Fasteners shall be expansion bolts or inserts for concrete, toggle bolts for hollow masonry or frame construction and preset inserts for pre-stressed concrete.
 3. For conduits supported on surface, provide straps with holes for one or two fasteners and shaped to fit conduit size.
 4. At structural steel members support raceway with hot dip galvanized beam clamps. Drilling or welding may be used only where indicated on the Drawings.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Install fastenings and supports as required for each type of equipment, cables and conduits, and to manufacturer's installation recommendations.
- B. Provide surface mounted supports for 2 or more conduits on channels at a maximum of 3 foot intervals. Provide metal brackets, frames, hangers, clamps and related types of support structures as required to support conduit and cable runs. Do not use wire lashing or perforated strap to support or secure raceways or cables.
- C. Provide adequate support for raceways, conduit and cables dropped vertically to equipment where there is no wall support.
- D. Do not use supports of equipment installed for other trades for conduit or cable support except with permission of the Resident Engineer.
- E. Install inert spacers for aluminum support brackets or channels directly in contact with concrete to reduce chemical reaction between support and concrete.

3.2 REMOTE CONTROL PANEL AND ANTENNA MAST

- A. The Contractor shall be responsible for the following installation work:
 1. Mounting of Transmitter Panel and Flow Transmitter Panel.
 2. At the base, connect to a 3/4 inch diameter, 10 foot, copper ground rod.
- B. Provide concrete foundation as required indicated on drawings and certified by a California registered Professional Engineer.

3.3 RACEWAY SUPPORTS

- A. Support raceway at intervals and at locations as required by the NEC. Do not use

perforated straps or plumbers tape for conduit supports. Independently support raceways from the structure.

- B. Install exposed raceways on walls below grade or in damp, wet, or corrosive locations with standoff brackets providing a minimum of 1/4 inch air space between the raceway and the mounting surface.
- C. Where raceway may be affected by dissimilar movements of the supporting structures or medium, provide flexible or expansion devices.

****END OF SECTION****

SECTION 16195

ELECTRICAL IDENTIFICATION

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes the requirements for equipment identification tags.
- B. Identify and label each raceway, piece of equipment, and conductor.
- C. Develop a schedule for labels showing the legend of each as shown on the Drawings. In the absence of specific data on the Drawings, develop legends from the nature of the service or system. Arrange the schedule to produce a legible comprehensive identification system.

1.2 SUBMITTALS

- A. Submit label schedule.

PART 2 -- PRODUCTS

2.1 EQUIPMENT IDENTIFICATION

- A. Use Micarta black letters on a white background unless otherwise specified for a specific application. Electrical enclosure nameplates shall be a minimum of 1 inch high by 3 inches wide with 0.125 inch letters. Engrave nameplates as shown on the Drawings or as approved on the submittal.
- B. Nameplates shall be fastened securely by fasteners of stainless steel, screwed into inserts or tapped holes as required.
- C. Provide labels manufactured by the Brady Identification Systems Division, Safety Sign Company, Westline Products Company, or equal.

2.2 RACEWAY IDENTIFICATION

- A. Provide labels manufactured by None Such Enterprises, or equal.
- B. Identification tape for protection of buried electrical installation shall be a 6-inch wide red polyethylene tape imprinted "Caution – Electric Utilities Below".

2.3 CONDUCTOR IDENTIFICATION

- A. Provide wire markers that are clip sleeve or sleeve type, made of PVC, nylon, or delrin, white in color, with black letters impressed in the material. On wire too large for the standard sleeve sizes, provide sleeve type markers inserted on a cable tie and the tie

then installed around the wire.

- B. Acceptable wire markers are Tyton Corporation Tygrup and Ty-Clip, Brady Clip-Sleeve, Panduit and Omnigrip, or approved equal.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Furnish and install nameplates on all field mounted devices, equipment and instruments supplied whether mounted inside an enclosure or field mounted. Securely fasten nameplates to each device or to a conduit clamp located near the device with 16 gage stainless steel wire or nylon self-locking straps.
- B. Indicate the device's name (i.e., BRM4201PI or ELLC300QA) based on the input/output point listing.

3.2 RACEWAY IDENTIFICATION

- A. Identify exposed raceways and raceways concealed above removable ceilings at each end within 12 inches of point to termination.
- B. Provide factory manufactured identifying labels with colored paper, machine printed with an identifying legend laminated between two sheets of vinylite plastic formed to completely encircle the raceway. Match the sizes of the labels with the raceway on which they are to be applied. Install labels in accordance with manufacturer's instructions.
- C. For legends to be used in the labels, indicate the system voltage and what it serves or type of service. The legend shall appear in a minimum of one inch high white letters on a black background for raceways 2-1/2 inch and smaller diameter and two inch high letters for raceways larger than 2-1/2 inch diameter.
- D. Install identification tape directly above buried raceway; Install tape 8 inches below grade and parallel with raceway to be protected.

3.3 EQUIPMENT IDENTIFICATION

- A. All panels and devices powered from an external source shall be provided with a nameplate which indicates the power source and circuit number for the panel or device.
- B. Label feeder units in panelboards, switchboards, disconnects, and motor control centers to identify the enclosure or piece of equipment and to indicate the motor device, outlet, or circuit controlled or monitored. Attach nameplates to inside surfaces with adhesive and to the outside surface with round head, self-tapping stainless steel screws. Nameplates shall be two-color laminated plastic not less than 1/16 inch thick, machine engraved to show white letters not less than 1/4 inch high on a black background.
- C. Type branch circuits in lighting panelboards on a card suitable for the card frame

furnished with the panel. The card shall bear the panel designation listed on the Drawings where this information is given, as well as indicate what each circuit controls.

3.4 CONDUCTOR IDENTIFICATION

- A. Identify power conductors terminating in panelboards, cabinets, motor control centers, and special service outlets at each end and in intervening junction and pull boxes. Where feeder conductors pass through a common box, tag the feeder to indicate the electrical characteristics, circuit number and panelboard designation. Locate labels near the conductor ends for terminals and on exposed portions of conductor within pull and junction boxes.
- B. Identify control wiring and instrument power and signal wiring at each end of each wire by a number conforming with the following:
 - 1. Base wire numbers on the instrument or equipment name shown on the Drawings, the I/O list, or stated in the Specifications. If cables are multi-conductor, number the individual wires. Where it is impractical to maintain the same wire numbers throughout, install a terminal block at the junction of the different numbered wires. On each side of the terminal block identify each associated wire number with a label either typed or written in with permanent ink.
 - 2. Tag wires at both ends with the same notation.
- C. All conduction identification numbers shall show on shop drawings.

****END OF SECTION****

SECTION 16421

UTILITY SERVICE ENTRANCE

PART 1 -- GENERAL

1.1 SECTION INCLUDES

- A. Arrangement with Utility Companies for permanent electric service.
- B. Underground service entrance.
- C. Metering equipment.

1.2 RELATED SECTIONS

- A. Section 16110 - Raceways.
- B. Section 16450 - Grounding.

1.3 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.4 SYSTEM DESCRIPTION

- A. System Characteristics: 208 volts, single phase, three-wire, 60 Hertz.

1.5 SUBMITTALS

- A. Submit under provisions of the General Requirements.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with Utility Company written requirements.
- B. Maintain one copy of each document on site.

1.7 REGULATORY REQUIREMENTS

- A. Conform to requirements of ANSI/NFPA 70.
- B. Furnish products listed and classified by Underwriters Laboratories, Inc. as suitable for purpose specified and shown.

1.8 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on Utility Company drawings.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Locate meter pedestal such that the pull section access meets the requirements of SDG&E.

2.2 MANUFACTURERS

- A. Milbank.
- B. Meyers.
- C. Substitutions: Approved equals.

2.3 METER PEDESTAL

- A. Ratings: NEMA 3R enclosure, 100 amp, 208 volt, single phase, three wire, 42, 000 amp AIC. Provide main overcurrent device as indicated.
- B. The meter pedestal shall have a meter socket with test blocks that meet the requirements of the serving utility (San Diego Gas and Electric Company). The service cabinet shall bear a UL 508 industrial control panel label for service entrance equipment.
- C. Cabinet shall be fabricated from 12 gauge hot dipped galvanized steel and shall be all welded construction. All fasteners, hinges, latches and hardware shall be of stainless steel and hinges shall be continuous piano style. Enclosure shall be vandal-resistant. There shall be no exposed, nuts, bolts, screws, rivets, or other fasteners on the exterior. Cabinet door shall have 2,000lb. Stress rated stainless steel hasp welded to cabinet and door.
- D. All bussing shall be U.L. approved copper THHN cable bussing fully rated 100 amps.
- E. Provide pad mount base for concrete foundation.
- F. Enclosure shall have a powder coat finish in accordance with ASTM B-117. Color shall be manufacturer's standard.

PART 3 -- EXECUTION

3.1 EXAMINATION

- A. Verify that service equipment is ready to be connected and energized.

3.2 PREPARATION

- A. Make arrangements with Utility Companies to obtain new permanent electric service.
- B. Coordinate location of Utility Companies facilities to ensure proper access is available.

3.3 INSTALLATION

- A. Install service entrance conduits from Utility Companies indicated point of connection

to meter pedestal per Utility Companies drawings.

****END OF SECTION****

SECTION 16450

GROUNDING

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes the requirements for grounding.

1.2 SUBMITTALS

- A. Manufacturer's Catalog Information for all products listed in Part 2.
- B. Testing results.

PART 2 -- PRODUCTS

2.1 GROUND CONNECTIONS:

- A. Water system piping clamps: Cast bronze clamps with stainless steel screws.
- B. Cable lugs: Shall be wrought copper with high pressure crimp sleeve for the conductor.
- C. Ground rod connections: Exothermic weld or high pressure crimp type.
- D. Exothermic welds: UL approved and or listed systems with mold, weld cartridges, and weld powder specifically approved for the particular application.
- E. Terminal lugs for shielded instrument cable: Crimp type sized to meet the specific shield requirements.

PART 3 -- EXECUTION

3.1 GENERAL

- A. Install the grounding electrode system with all required components in accordance with NEC Article 250.
- B. Provide and install at least one ground rod at each instrument or panel rack. The length of rods forming an individual ground array shall be equal in length and shall be of the quantity required to obtain a ground resistance of less than 5 ohms.
- C. Unless otherwise specified, ground all non-current carrying metallic parts of electrical equipment, support structures, raceway systems, and the neutral of all wiring systems in accordance with the NEC and other applicable codes and with the manufacturer's recommendations.

- D. All grounds and ground systems shall be bonded together.
- E. Grounding system may be bonded to buried metal piping not less than 2-inch diameter or provide grounding rod driven a minimum of nine feet in the ground. The ground clamp connection to the metal pipe shall be not more than one foot inside the building. Ground conductor for connection to ground rod shall be stranded copper and connected by the exothermic welding process. Earth buried ground conductors shall not be insulated. File or sand surfaces before connecting ground to ensure good metal to metal contact.
- F. Bond the grounding conductors to metallic enclosures at each end and to all intermediate metallic enclosures. Where equipment contains a ground bus, extend and connect grounding conductors to that bus. Run ground conductors inside conduits enclosing the power conductors.
- G. Make connections of grounding conductors to circuits 20 amps or above by a solderless terminal and a 5/16 minimum bolt tapped to the motor frame or equipment housing. Ground connections to smaller equipment may be made by fastening the terminal to a connection box. Connect junction boxes to the equipment grounding system with grounding clips mounted directly on the box or with 3/8-inch machine screws. Remove all paint, dirt, or other surface coverings at grounding conductor connection points so that good metal to metal contact is made.

3.2 PANEL AND ENCLOSURE GROUNDING

- A. Bond panels and enclosures to building grounds.
- B. Provide new ground rod where ground cable routed with conduit is not bonded to earth ground within 50 feet. Bond equipment-grounding conductors to earth ground through the panel.

3.3 INSTRUMENT SIGNAL SHIELD GROUNDS

- A. Ground instrument signal shields at one location only.
- B. Termination of each shield drain wire shall be on its own terminal screw. All of the terminal screws in one rack or panel shall be jumpered with No. 16 solid tinned bare copper wire; connection to ground shall be accomplished with a No. 12 green insulated conductor to the main ground bus
- C. As a general rule, ground shields at local or area control panels nearest the instrument. If no panel is nearby, ground shields at the instrument power source. If a signal passes through several panels, ground at the panel with the most loops.
- D. At the ungrounded end, trim back and insulate shield.
- E. If a signal passes through a junction box or barrier strip, maintain shield continuity.

3.5 TESTING

- A. All tests shall be performed in the presence of the Resident Engineer.

- B. Perform a thorough visual and mechanical inspection to ensure all items are in place and connected with all termination made in an approved manner.

****END OF SECTION****

SECTION 16640
CATHODIC PROTECTION SYSTEM

PART 1 - GENERAL

1.1 THIS SECTION INCLUDES

- A. The WORK of this Section includes providing a complete cathodic protection system for the following structure as outlined in this Section and on the Drawings:
 - 1. Approximately 5,700 linear feet of 66-inch mortar-lined and tape coated steel pipeline. The exterior of the pipeline shall have a concrete armor coat over the tape, field applied mortar over the tape coated joints and field applied mortar over any pipeline fittings or appurtenances that are not encapsulated in petrolatum wax tape.
- B. Electrical isolation of the structure from adjacent metallic structures, steel reinforced concrete structures, structures of dissimilar metal or dissimilar coatings, conduits and all other metallic components that may impact the operation of the cathodic protection system.
- C. Installation of an impressed current rectifier, deep anode well, flush mounted test stations and all other work described herein and on the Drawings.
- D. Bonding of all non-welded, non-insulating pipe joints with stranded copper cables.
- E. Provision of electrical power for rectifiers including any permits, trenching, conduits, services meters, and other items required. Not all required items are shown on the Drawings.
- F. Testing of system during installation including electrical continuity of the pipeline.
- G. Cleanup and restoration of work site.
- H. Testing the system after installation and backfill (Final System Checkout).

1.2 REQUIREMENTS

- A. If the products installed as part of this Section are found to be defective or damaged or if the WORK of this Section is not in conformance with these Specifications then the products and WORK shall be corrected at the CONTRACTOR's expense.
- B. Any retesting required due to inadequate installation or defective materials shall be paid for by the CONTRACTOR.
- C. The WORK also requires that one Supplier or Subcontractor accept responsibility for the WORK as indicated, but without altering or modifying the CONTRACTOR's responsibilities under the Contract Documents.
- D. The WORK also requires coordination of assembly, installation and testing between the pipeline contractor and any cathodic protection material supplier or subcontractor.

1.3 RELATED SECTIONS

- A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the Specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.
 - 1. Site Safety and Regulatory Requirements
 - 2. Excavation, Trenching, Backfilling, and Compacting
 - 3. Piping
 - 4. Cast-In-Place Concrete
 - 5. Protective Coatings

1.4 REFERENCED SPECIFICATIONS, CODES AND STANDARDS

- A. The WORK of this Section shall comply with the current editions of the following codes

and standards:

1. AWWA American Water Works Association
 - a. C217 Microcrystalline Wax and Petrolatum Tape Coating Systems for Steel Water Pipe and Fittings
2. ASTM ASTM International
 - a. A518 Standard Specification for Corrosion-Resistant High-Silicon Iron Castings
 - b. D1248 Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
 - c. D1785 Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe; Schedules 40, 80, and 120.
 - d. C94 Standard Specification for Ready-Mixed Concrete
 - e. B3 Standard Specification for Soft or Annealed Copper Wire
 - f. B8 Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
3. AASHTO American Association of State Highway and Transportation Officials
 - a. H20 Specification for Highway Bridges
4. NACE NACE International
 - a. SP0169 Standard Practice, Control of External Corrosion on Underground or Submerged Metallic Piping Systems
 - b. SP0200 Steel-Cased Pipeline Practices
 - c. SP0286 Electrical Insulation of Cathodically Protected Pipelines
 - d. TM0497 Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems
 - e. SP0572 Design, Installation, Operation and Maintenance of Impressed Current Deep Groundbeds
5. NFPA National Fire Protection Association
 - a. NFPA 70 National Electric Code (NEC)
6. DWR Department of Water Resources
 - a. CSB No. 74 California State Bulletin Number 74
7. SDG&E Electric & Gas Service Requirements (Greenbook)
8. NEMA National Electrical Manufacturers Association
 - a. 250 Enclosures for Electrical Equipment (1,000 Volts Maximum)
 - b. TC2 Electrical Polyvinyl Chloride (PVC) Tubing and Conduit
 - c. TC3 PVC Fittings for Use with Rigid PVC Conduit and Tubing
9. UL Underwriters Laboratories

Rigid Metal Conduits

- a. 514B Fittings for Cable and Conduit
- B. Whenever the Drawings or these Specifications require a higher degree of workmanship or better quality of material than indicated in the above codes and standards, these Drawings and Specifications shall prevail.

1.5 PERMITS AND JOB ACCESS

- A. Prior to the start of construction, the CONTRACTOR shall apply to the required authorities for permits required for installation of the cathodic protection system.
- B. The CONTRACTOR shall contact Underground Service Alert prior to commencing

construction to locate existing utilities in the area of construction. Existing utilities include, but are not limited to, water lines, gas lines, telephone, street lights, sewer and storm drains and overhead and underground electric utilities.

- C. The CONTRACTOR shall be responsible for reviewing the rectifier locations to determine if there are any conflicts with obtaining power from the indicated locations. The CONTRACTOR shall report any conflicts to the ENGINEER prior to proceeding with the Work.
- D. The CONTRACTOR shall submit an application to the local power company for AC power to the new rectifier. CONTRACTOR shall be responsible for all fees and expenses associated with providing power to the rectifiers.
- E. Traffic control shall satisfy the requirements of the governing locality.

1.6 QUALITY ASSURANCE

- A. Installation of the cathodic protection equipment shall be performed by individuals having experience in the installation of the cathodic protection equipment described herein.
- B. All well drilling shall be performed by a California licensed (C-57) Well Drilling CONTRACTOR.
- C. All deep well installations shall be installed in accordance with CSB No. 74 well standards and the applicable sections on wells from local regulations.
- D. All testing required to be performed by a "qualified corrosion technician" shall be performed by a NACE Level 2 CP Technician under the supervision of a Corrosion Engineer. A Corrosion Engineer is a Registered Professional Corrosion Engineer or a NACE Level 4 Cathodic Protection Specialist.

1.7 SUBMITTALS

- A. The following shall be submitted to the ENGINEER prior to any equipment installation.
 - 1. Catalog cuts, bulletins, brochures, or data sheets for all materials specified herein.
 - 2. Certification that the proposed equipment and materials meet the Specifications and the intent of the Specifications.
 - 3. Written certification of experience required.
 - 4. Schedule including the expected start date and planned completion date.
 - 5. Copy of well drilling permits.
- B. The following shall be submitted to the ENGINEER after completion of the WORK.
 - 1. Wire connection testing.
 - 2. Insulating joint testing, before and after backfill.
 - 3. Casing insulator testing, before and after backfill.
 - 4. Electrical Continuity Testing
 - 5. Well completion report.
 - 6. Electrical log with anode-to-earth resistances.
 - 7. System check-out report.
 - 8. Record Drawings shall be submitted to and approved by the ENGINEER before the WORK is considered complete.
- C. The following shall be included in the rectifier's Owner's Manual:
 - 1. Operations and maintenance instructions.
 - 2. List of spare parts recommended for 2 years of successful operation.

1.8 INTERFERENCE AND EXACT LOCATIONS

- A. The locations of cathodic protection equipment, test stations, devices, outlets and appurtenances as indicated are approximate only. Exact locations shall be determined by the CONTRACTOR in the field subject to the approval of the ENGINEER.
- B. The CONTRACTOR shall field verify all data and final locations of work done under other Sections of the Specifications required for placing of the electrical work.

- C. In case of interference with other work or erroneous locations with respect to equipment or structures, the CONTRACTOR shall furnish all labor and materials necessary to complete the WORK in an acceptable manner.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials installed must be new. All equipment and materials supplied shall be similar to that which has been in satisfactory service for at least 5 years.

2.2 RECTIFIERS

- A. Rectifier shall be a Model ES-II rectifier featuring an air cooled single phase AC input and 12 Volts, 5 Amperes DC output as manufactured by Universal Rectifiers, Inc., Corppower Rectifiers, Inc., or approved equivalent.
- B. Rectifier shall be designed to operate continuously at an ambient temperature of 50°C without damage to the rectifier components.
- C. Transformer:
 - 1. Two-winding, insulating type, meeting requirements of NEMA and UL.
 - 2. Rectifier shall be capable of operating continuously at the rated output current at any voltage from zero to 100% without damaging any rectifier components. Full rated DC output voltage shall be adjustable by not less than 18 equal steps from approximately 5% of rated voltage to full rated output voltage. This adjustment shall be accomplished with silver plated or stainless steel connectors and adjustment link bars.
- D. Rectifying element shall be a full-wave bridge, silicon diode stack with efficiency filter, metal oxide thyristors, and current-limiting devices for overvoltage and overcurrent protection of stack. Silicon stacks shall be equipped with silicon diodes rated at a minimum of 800 peak inverse Volts.
- E. All rectifiers shall have overload and lightning protection for both AC and DC circuits.
- F. Both a panel voltmeter and a panel ammeter shall be provided. Voltmeter and ammeter shall be calibrated and adjusted at the factory.
- G. Rectifier shall be installed with a GPS300 synchronized interrupter manufactured by MicroMax instruments, or approved equivalent.
- H. Electrical tests shall be performed by the manufacturer and recorded as listed below:
 - 1. AC Volts Input
 - 2. AC Amperes Input
 - 3. Apparent Watts Input
 - 4. True Watts Input
 - 5. Power Factor
 - 6. DC Volts Output
 - 7. DC Amperes Output
 - 8. DC Watts Output
 - 9. Conversion Efficiency
 - 10. Dielectric Strength
 - 11. Transformer Primary to Ground
 - 12. Transformer Secondary to Ground
 - 13. Transformer Primary to Secondary
 - 14. Stack AC to Ground
 - 15. Stack DC to Ground
 - 16. Ripple Voltage at Full Output

- I. The following shall be provided for the rectifier. Each item shall be provided in a waterproof bag or container.
 1. Operations and Maintenance Manual
 2. Circuit Diagram
 3. Electrical Test Report

2.3 ELECTRICAL ENCLOSURE

- A. Electrical enclosure shall be a Myers MSX cabinet enclosure conforming to NEMA 250 and shall be sized as required. Enclosure shall be keyed to use existing City of San Diego rectifier cabinet locks.
- B. Electrical enclosure shall be made of 10-gauge steel and shall be coated with a baked enamel finish.
- C. Enclosure shall have a single door with a full length hinge and a 3-point lockable latch.
- D. Enclosures shall be equipped with permanent identification tags affixed to the outside front door. The identification tag shall have white engraving for identification of the rectifier. Minimum height of lettering shall be 3/4-inch. The tags shall have the following legend:

City of San Diego
Midcity Pipeline
Cathodic Protection Rectifier

2.4 HIGH SILICON CAST IRON ANODES

- A. Cast iron anodes shall be Type 2684 Z Corrosion Resistant High Silicon Iron Castings manufactured by Anotec Industries, or approved equal, and in accordance with ASTM A518, Grade 3.
- B. High silicon cast iron anodes shall be tubular type anodes with a length of 84-inches, a nominal diameter of 2.7-inches, a minimum surface area of 4.9-square feet, a minimum weight of 70 pounds, and shall be furnished with the wire attached to the interior of the anode and sealed using manufacturer's standard connection.
- C. The wire attached to the anodes shall be stranded copper wire and insulated for 600 Volts. Wire size shall be AWG No. 6. Wire insulation shall be a dual extrusion type. The outer insulation jacket shall be HMWPE and the inner insulation shall be fluorinated polymer. The wire shall be Halar cathodic protection wire or equivalent and shall conform to the requirements of ASTM D1248 Type 1, Class C, Grade 5. Anode wire connection shall have a pulling strength exceeding the wire's tensile strength. Any damage to the wire insulation or anode shall require complete replacement of the wire and anode.
- D. The resistance of each anode wire connection shall not exceed 0.004 Ohms. Each anode wire connection should be tested for conformance with these Specifications. A record of tests shall be submitted to the ENGINEER. The records shall include a minimum of three copies of the following information:
 1. Anode numbering system to identify anode under test
 2. Anode wire length
 3. Resistance value as indicated by test
 4. Test equipment
 5. Test method
- E. Anodes shall be individually labeled with the length of lead wire and anode number. Anodes shall be consecutively numbered with the deepest anode being Number 1.
- F. Anode wires shall be of one continuous length without splices from the anode connection to the junction box. Anode wires with the attached anodes shall be shipped to the job site with the wire wound on a reel. The minimum core diameter of the reel shall be 5-1/2 inches. The anode wire insulation shall be free of surface damage such

as nicks, abrasions, scratches, etc., in all respects throughout the entire length of the wire. Precaution shall be taken during fabrication, transportation and installation of the anodes to ensure that the wire is not kinked or sharply bent. Bends sharper than 2-1/2 inches in radius are not permissible.

2.5 CALCINED COKE BREEZE

- A. Backfill material for impressed current anodes shall be calcined petroleum coke breeze with a resistivity of 25 Ohm-cm or less when tested with an applied pressure of 2 psi.
- B. The calcined coke breeze backfill shall have the following chemical properties:
 - 1. Fixed carbon 98.0% minimum
 - 2. Ash 0.5% maximum
 - 3. Sulfur 2.0% maximum
 - 4. Volatile matter 1.0% maximum
 - 5. Moisture 1.0% maximum
- C. Coke breeze backfill shall be Loresco SC-2, Loresco SC-3, Asbury 251, Asbury 218-R or approved equivalent

2.6 ANODE VENT PIPING

- A. Plastic conduit for the impressed current anode vent piping shall be 2-inch diameter PVC, Schedule 80, conforming to ASTM D1785, Type 1 Grade 1, NEMA TC2 for conduit and TC3 for fittings.
- B. Plastic conduit in the coke breeze column shall be a slotted vent pipe featuring a slot width of 0.100 inches and 4 slots per inch.

2.7 ANODE CENTRALIZERS

- A. Anode centering devices shall be Item No. Cen-52 as manufactured by Mesa Products, Model CENTRA2 as manufactured by Farwest Corrosion, or approved equivalent. Anode centralizers shall be submitted to the ENGINEER for acceptance prior to use.

2.8 ANODE TERMINAL BOARD

- A. Panel boards shall be made of 1/4-inch thick phenolic plastic sized as indicated on the Drawings.
- B. Connection hardware shall be brass or bronze. All connections shall be double nutted bolts with lock washers.
- C. Copper bus bar shall be 1/8-inch thick and sized to fit. The copper bus bar shall be per ASTM B187, 98% conductivity.

2.9 SOLDERLESS LUG CONNECTORS

- A. Solderless lug connector shall be made of brass or copper with a brass screw. The lug shall be designed for direct burial and shall be appropriately sized for the connection wire. The lug shall be ILSCO Type XT-6DB or approved equivalent.

2.10 SHUNTS FOR IMPRESSED CURRENT ANODES

- A. Shunts for impressed anodes for the impressed current anode systems shall be 0.01-Ohm and 8-Ampere capacity. Shunts shall be Type JB as manufactured by Holloway or equivalent.

2.11 CONCRETE TRAFFIC VALVE BOXES

- A. Traffic valve boxes shall be rated to withstand AASHTO H20 traffic loading. The traffic valve boxes shall be G5 Utility Boxes as manufactured by Christy Concrete Products, Inc., No. 3RT Utility Box as manufactured by Brooks Products or approved equivalent. Traffic box covers for test stations shall be cast iron with welded bead legend and labeled "Corrosion" as required. Concrete Traffic Valve Boxes and traffic box lids shall conform to SDW-128 and City of San Diego standards.

2.12 READY-MIXED CONCRETE

- A. Ready-mixed concrete shall be in accordance with ASTM C94.
- B. Concrete used for anode well concrete cap shall have a minimum compressive strength

of 4000 PSI.

2.13 CONDUIT AND FITTINGS

- A. The minimum conduit size shall be 1 inch unless otherwise indicated. Refer to NFPA 70 (NEC) for additional conduit size requirements.
- B. Conduit and fittings placed below grade shall be PVC, Schedule 80.
- C. Conduit and fittings placed above grade shall be rigid steel. Rigid steel conduit shall be galvanized conforming to UL 6.
- D. Conduit straps shall be a 2-hole galvanized steel conduit strap.
- E. Fittings for use with rigid steel conduit shall be galvanized cast ferrous metal, with gasketed covers, Crouse Hinds Condulets, Appleton Unilets, or equivalent. Rigid metallic conduit fittings shall be galvanized conforming to NEMA FB 1, UL 514B listed.
- F. Union couplings for conduits shall be the Erickson or Appleton type EC or 0-Z Gedney 3-piece Series 4, or equivalent.

2.14 UTILITY WARNING AND IDENTIFICATION TAPE

- A. The warning and identification tape shall be an inert plastic film designed for prolonged underground use. The tape shall be a minimum of 6 inches wide and a minimum of 4 mils thick. The tape shall be continuously printed over the entire length with the wording "CAUTION: CATHODIC PROTECTION CABLE BURIED BELOW". The wording shall be printed using bold black letters. The color of the tape shall be red.

2.15 WIRES

- A. Conductors shall consist of stranded copper of the gauge indicated. Wire sizes shall be based on American Wire Gauge (AWG). Copper wire shall be in conformance with ASTM Designations B3 and B8.
- B. All wires terminating on the anode terminal board or in a test station shall have a wire identifier attached within 4 inches from the end of wire at the terminal board, prior to backfill, as specified under "Wire Identification".
- C. High molecular weight polyethylene (HMWPE) insulating jackets shall conform to ASTM D1248.
- D. Test Station: Single-conductor, No. 6 AWG stranded copper with HMWPE insulation. Multi-stranded test leads or wire splicing is not allowed.
- E. Insulation Colors: As shown on Drawings.

2.16 WIRE IDENTIFIERS

- A. Wire identification tags shall be in accordance with the City of San Diego standard drawing SDW-131.

2.17 EXOTHERMIC WELDS

- A. Exothermic welds shall be in accordance with the manufacturer's recommendations. Exothermic welds shall be Cadweld, as manufactured by Erico Products, Inc. or Thermoweld as manufactured by Continental Industries, Inc., or approved equivalent. Duxseal packing as manufactured by Johns-Manville or approved equivalent shall be used where necessary to prevent leakage of molten weld metal.
- B. The shape and charge of the exothermic weld shall be chosen based on the following parameters:
 - 1. Pipe material
 - 2. Pipe size
 - 3. Wire material/size and requirement for sleeves
 - 4. Number of strands to be welded
 - 5. Orientation of weld (vertical or horizontal)

2.18 CABLE-TO-PIPE COATING MATERIAL

- A. Coating material for exothermic weld connections to the tape wrapped/mortar overcoated steel pipelines shall be two-part epoxy resin such as Scotchcast Electrical Insulating Resin 4 manufactured by the 3M Company, or approved equivalent.
- B. Coating material for exothermic weld connections to the mortar coated steel pipelines shall be two part epoxy resin such as Scotchcast Electrical Resin 8 manufactured by the 3M Company, or approved equivalent.
- C. Coating material for exothermic weld connection to the steel casings shall be two-part epoxy putty such as ProPoxy 20 as manufactured by Hercules Chemical Company, or approved equivalent. The epoxy putty shall be non-conductive and have compression strength of 18,000 psi when cured.

2.19 DIELECTRIC INSULATING FLANGE KITS

- A. Insulating flange gaskets shall include full faced gaskets, insulating sleeves and washers and steel bolts, nuts and washers. The complete assembly shall have a pressure rating equal to or greater than the flanges between which it is installed. Sleeves, gaskets and insulating washers shall be G-10 composite materials and have a dielectric constant of 300 Volts per mil, minimum. Steel washers shall fit well within the bolt facing on the flange. Insulating washers shall fit within the bolt facing the flange over the outside diameter of the sleeve.

2.20 PETROLATUM TAPE

- A. Petrolatum tape system shall be Trenton Primer and #1 Wax-tape, as manufactured by Trenton Corp., or Denso Paste and Densyl Tape by Denso North America, Inc., or approved equivalent.

2.21 NEOPRENE MAT

- A. A 1/4-inch thick neoprene mat shall be installed between the project pipeline and the foreign pipeline at each joint pipeline test station. Each mat shall be sized so that the edge of the mat extends a minimum of 24 inches from both sides of the foreign pipeline.

PART 3 - EXECUTION

3.1 STORAGE OF MATERIALS

- A. All materials and equipment to be used in construction shall be stored in such a manner to be protected from detrimental effects from the elements. If warehouse storage cannot be provided, materials and equipment shall be stacked well above ground level and protected from the elements with plastic sheeting or other method as appropriate.

3.2 EXCAVATION AND BACKFILL

- A. Buried wires shall be placed in conduit and have a minimum cover of 36-inches.
- B. Caution tape shall be installed above buried wire. Caution tape shall be installed a minimum of 6 inches above underground wires and conduits.
- C. Anode wire identification tags shall be placed on the wires prior to placing wire in conduit or backfilling.

3.3 RECTIFIER

- A. Approximate locations of rectifier and electrical power are shown on the Drawings. Rectifier installation includes provision of AC power to the rectifier by the CONTRACTOR. CONTRACTOR shall furnish and install all required wiring, conduits, cables, meters, splice boxes, and equipment as necessary for operation of the rectifier and as required by the local power agency.
- B. The CONTRACTOR may propose an alternative rectifier location to the CITY for review and approval. The reinforced concrete pad shall be constructed such that water will not collect against the rectifier cabinet. The concrete pad at the Cone Valve location shall extend 2 inches above grade. The asphalt adjacent to the concrete pad shall slope away from the concrete pad for a distance of 1 foot. The vent pipe riser and conduits

into the enclosure shall be cast into the concrete pad. After the concrete is set, the enclosure shall be securely anchored to the pad with expanding anchor bolts. Use leveling nuts below the cabinet flange to create space for the grout seal. Apply the non-shrink grout as shown on the enclosure detail.

3.4 IMPRESSED CURRENT ANODE INSTALLATION

- A. Impressed current anode beds shall be installed in accordance with NACE RP0572, CSB No. 74, San Diego County Well Standards, and these Specifications.
- B. Well Drilling
 - 1. The CONTRACTOR shall obtain and pay for all fees and permits required for well drilling.
 - 2. Drilling of the anode well shall be done in the presence of the ENGINEER. A minimum of 48 hours notice shall be given by the CONTRACTOR to the ENGINEER prior to drilling the well. Drilling of the well shall begin early enough in the day to ensure completion of the well during regular working hours.
 - 3. The CONTRACTOR shall protect the well bore from the intrusion of contaminants into the hole at all times. The CONTRACTOR is responsible for the cost of all cleanup associated with contamination of the well and/or job site resulting from the CONTRACTOR's WORK.
 - 4. Fresh water shall be circulated from the bottom of the hole to clear the well of drilling mud and cuttings after the well is drilled.
 - 5. Loading of anodes and other equipment in the well shall be done in the presence of the ENGINEER. A minimum of 48 hours notice shall be given by the CONTRACTOR to the ENGINEER prior to loading anodes. Loading of the anodes into the well shall begin early enough in the day to ensure completion of all loading, including backfilling, during regular working hours.
 - 6. The well shall be covered with a steel trench plate or other heavy device that blocks access and that cannot be removed by hand whenever the well is left unattended.
- C. Well Casing
 - 1. The CONTRACTOR may elect to install the well with or without a casing. In the event that the well collapses, for any reason, including the elimination of the casing, the well shall be relocated, redrilled and the original hole abandoned at the CONTRACTOR's expense. Only a metallic casing may be used in the coke breeze column.
- D. Vent Pipe
 - 1. The bottom of the vent pipe shall be securely capped.
 - 2. The top of the vent pipe shall be temporarily sealed during the coke breeze loading process. Any foreign material entering the vent pipe shall be removed.
- E. Anodes
 - 1. The ENGINEER shall visually inspect the insulation on the anode lead wire for abrasion or other damage to the insulation and wire as the anode is lowered into place. Anodes with damaged insulation or wire are not acceptable and shall not be installed. Splices are not allowed on the anode wire.
 - 2. Attach the centering devices to the anodes using the adjustable stainless steel bands. The terminal end of the anode cables shall be identified with permanent cable markers. Anode No. 1 shall be attached to the bottom section of the anode vent pipe with adjustable stainless steel bands and lowered into the hole. A digital soil resistance meter, furnished and operated by the ENGINEER, shall be connected between the anode lead wire for Anode No. 1 and the drain cable. The

drain cable must be installed and be accessible to the ENGINEER during time of testing. The CONTRACTOR shall stop lowering the anode at 10-foot intervals to tape the anode lead to the vent pipe and to allow the ENGINEER to measure the resistance profile of the anode well. This shall continue to the bottom of the hole and the vent pipe shall be secured in place.

3. Continuing with Anode No. 2, with centralizers attached, the anodes shall be lowered into the hole supported by the attached lead wires. The CONTRACTOR shall fabricate an apparatus that allows the anodes to be lowered by the lead wire but does not bend the wire into a radius less than 2.5 inches. All sharp edges on the centering device assembly shall be taped with vinyl electrical tape to preclude damaging any wires while lowering anodes into place. The vent pipe shall not be attached to Anode No. 2. The ENGINEER may adjust the depths of the individual anodes to avoid high resistance soil layers. When an anode has been placed at the final depth it shall be securely fixed in that position prior to coke breeze backfill. Anodes shall not be backfilled until the ENGINEER has inspected the placement of the anodes and given permission to backfill.

F. Coke Breeze Backfill.

1. Coke breeze shall be placed in the hole at a steady rate to ensure that the coke breeze does not bridge or block the hole. The hole shall be kept completely full of water during placement of backfill.
2. Settling of the backfill and coverage of the anodes will be determined by measuring the anode-to-earth resistance from the digital resistance meter. During coke breeze backfill, the ENGINEER will measure the resistance between the lowermost uncovered anode and the protected structure. Coverage of the anode will be indicated by a rapid decrease in resistance, normally by at least 50%. As soon as coverage of a lower anode is indicated, the circuit shall be attached to the next highest anode in the hole. Testing will continue until coverage of all anodes has been verified. The ENGINEER shall record the resistance of each backfilled anode. Coke breeze shall be added to a minimum of 20 feet above the top anode. The CONTRACTOR shall sound the anode hole with a weighted tape measure and determine the final height of the coke breeze column.
3. Coke shall be allowed 24 hours to settle. After 24 hours, the coke column shall be topped off as required to achieve the specified coke column length.
4. Incomplete coverage of each anode with coke breeze shall be cause for rejection of the anode well.
5. The CONTRACTOR shall record the total weight of coke breeze placed in each anode well.

G. Well Seal

1. Backfilling operations above the coke breeze column shall begin no sooner than 24 hours after installation of the coke breeze to allow for settling. Backfilling shall be done continuously, without interruption, until the hole is sealed.
2. Collapse of the hole prior to the introduction of the seal material shall be cause for abandonment of the well at the CONTRACTOR's expense.
3. Sealing materials shall not be allowed to drop from the top of the hole. All materials shall be pumped into the hole from the top of the coke breeze column to the top of the hole.
4. If well casing materials are used in the construction of the well, then the annular space between the well bore and the casing shall also be sealed with a conductive grout.
5. Sealing material shall not enter the vent pipe.

6. The CONTRACTOR shall record the volume of sealing material installed in the hole.
- H. Storage and disposal of drilling fluids, cuttings and mud:
1. During the drilling and loading process, drilling fluids, cuttings, and mud shall be stored onsite in uncontaminated, watertight, lockable debris boxes. Alternative storage methods may be utilized only with prior approval of the ENGINEER.
 2. Drilling mud and cuttings shall be disposed of by the CONTRACTOR at a suitable disposal site in accordance with all local, state, and federal regulations.
- 3.5 TEST STATIONS
- A. Test stations shall be installed at the approximate locations shown on the Drawings. Flush mounted test stations shall be located behind the curb and other areas not subject to vehicular traffic to allow for safe access by City monitoring personnel which will not require traffic control. Placement in the center median is not permitted. The CONTRACTOR shall field verify final location of the test stations. Wire identifiers shall be placed on all wire prior to backfill and installation of test stations.
 - B. Installation of test stations shall be done in the presence of the ENGINEER. A minimum of 48 hours notice shall be given by the CONTRACTOR to the ENGINEER prior to installation of a test station. Installation of test stations shall begin early enough in the day to ensure completion of the installation during regular working hours.
 - C. The CONTRACTOR shall notify the owner of foreign utility piping for which joint pipeline test stations are to be installed. Notification shall be provided at least 2 weeks in advance. Test leads to foreign pipelines shall be installed in the presence and to the satisfaction of a representative of the foreign pipeline owner.
 - D. The CONTRACTOR shall provide global positioning system (GPS) coordinates of each test station location with a minimum accuracy of 1 meter or 3 feet. The CONTRACTOR shall submit the GPS coordinates of the test stations to the ENGINEER after installation.
- 3.6 WIRES
- A. Buried wires shall be placed in conduit and laid straight without kinks. Each wire run shall be continuous in length and free of joints or splices, unless otherwise indicated. Care shall be taken during installation to avoid punctures, cuts or other damage to the wire insulation. Damage to insulation shall require replacement of the entire length of wire at the CONTRACTOR's expense.
 - B. 18 inches of slack (coiled) shall be left for each wire at each flush-to-grade test station. Wire slack shall be sufficient to allow removal of wire extension for testing. Wire shall not be bent into a radius of less than 2 inches.
 - C. The wire conduits must be of sufficient diameter to accommodate the wires. This shall be determined by the number and size of wires in accordance with the applicable electrical codes and standards.
- 3.7 WIRE IDENTIFIERS
- A. All wires shall be coded with wire identifiers.
 - B. Wire identifiers shall be placed on the wires prior to backfill.
- 3.8 EXOTHERMIC WELD CONNECTIONS
- A. Exothermic weld connections shall be installed in the manner and at the locations indicated. Coating materials shall be removed from the surface over an area of sufficient size to make the connection. The surface shall be cleaned to bare metal by grinding or filing prior to welding the conductor. The use of resin impregnated grinding wheels will not be allowed. A copper sleeve shall be fitted over the conductor. Only enough insulation shall be removed such that the copper conductor can be placed in the welding mold.

- B. The CONTRACTOR shall be responsible for testing all test lead welds. The ENGINEER, at his or her discretion, shall witness these tests.
- C. After the weld has cooled, all slag shall be removed and the metallurgical bond shall be tested for adherence by the CONTRACTOR. A 22-ounce hammer shall be used for adherence testing by striking a blow to the weld. Care shall be taken to avoid hitting the wires. All defective welds shall be removed and replaced.
- D. After backfilling the pipe, all test lead pairs shall be tested for broken welds using a standard ohmmeter. The resistance shall not exceed 150% of the theoretical wire resistance as determined from published wire data.
- E. The CONTRACTOR shall inspect both the interior and exterior of the pipe to confirm that all coatings and linings removed or damaged as a result of the welding have been repaired. The CONTRACTOR shall furnish all materials, clean surfaces and repair protective coatings and linings damaged as a result of the welding. Repair of any coating or lining damaged during welding shall be performed in accordance with the coating or lining manufacturer's recommendations.
- F. All exposed surfaces of the copper and steel shall be covered with insulating materials as indicated.
- G. Mortar shall be applied to the project pipeline at all wire-to-pipe connections. The mortar shall match the exterior mortar. Coating repairs shall be performed in accordance with the coating Manufacturer's recommendations.

3.9 PETROLATUM TAPE SYSTEM APPLICATION

- A. Petrolatum tape system shall be applied on insulating joints and as indicated in the Drawings. Petrolatum tape system shall be applied in accordance with AWWA C217, and these Specifications. The materials shall be applied according to the Manufacturer's recommendations.
- B. All loose scale shall be removed from the surface to be coated with hand tools (wire brush, scraper, rags). Debris and moisture shall be wiped from surface with clean rag. Petrolatum tape shall be applied immediately after applying the primer, using a 1-inch overlap. A spiral wrap shall be used and a slight tension shall be applied to ensure that there are no air pockets or voids. After applying the tape, the applicator shall firmly press and smooth out all lap seams and crevice areas. The tape shall be in tight intimate contact with all surfaces.

3.10 WIRE CONNECTIONS

- A. After installation, all wire connections shall be tested at the test station locations, by the CONTRACTOR, to ensure that they meet the requirements and intent of the Contract Documents.

3.11 INSULATING JOINTS/DIELECTRIC UNIONS

- A. Insulating joints shall be installed to effectively isolate metallic piping from foreign metallic structures. Provide a minimum of five days advance notice to the Engineer before assembling insulated pipe flanges 60 inches or larger in diameter to allow for coordination and observance of its installation. The Engineer shall inspect the condition of the gasket's O-ring immediately before the gasket is installed to ensure it is free of cracks, dry rot, cuts, or other defects.
- B. Install pipe flange insulating materials at the locations shown on the Plans. Install pipe flange insulating materials in accordance with the manufacturer's recommendations and NACE standard practice SP0286, "Electrical Isolation of Cathodically Protected Pipelines." Particular attention shall be paid to properly aligning the flanges prior to inserting the insulating sleeves around flange bolts. Prevent moisture, soil, or other foreign matter from contacting any portion of the insulated flange prior to or during installation. If moisture, soil, or other foreign matter contacts any portion of the insulated

flange, disassemble it, clean with a suitable solvent and dry prior to reassembling. Follow the manufacturer's recommendations regarding the torquing pattern of the bolts and the amount of torque to be used when installing the flange insulating kit. Do not use conductive grease on the flange bolts or any other flange components. Note: the following products have been tested for electrical conductivity and approved for use: Huskey 2000 Lubricating Paste & Anti-Seize compound, 3M Super 77 Spray Adhesive, and Triflow aerosol lubricant with Teflon additive.

- C. Test the electrical isolation effectiveness of each insulated pipe flange. This testing shall be performed by the Contractor's Cathodic Protection Engineer and witnessed by the Engineer. The Contractor shall provide written notice of this testing to the Engineer a minimum of two days in advance. If the insulated pipe flange will be buried, it shall be tested for electrical isolation by the Contractor before the wax tape coating is applied. At the Engineer's option, the City of San Diego may repeat this testing during or immediately after the installation of the insulating flange. Replace or repair any insulated pipe flange that is determined to not meet the minimum electrical isolation requirements in this specification. The effectiveness of insulating flanges shall be determined using the following test techniques in the order shown until one of the criteria is achieved or as otherwise directed by the Engineer.
1. Electrical Potential Difference Test: Electrically bond the pipe on the vault or unburied side of the insulating flange to an electrical ground with a maximum resistance to remote soil of 5-Ohms. If the pipe on both sides of the insulating flange is mechanically connected to a minimum 50-feet of buried pipe, then the pipe does not need to be bonded to an electrical ground for this test. Measure the CP Potential of the pipe on both sides of the insulating flange using a copper/copper sulfate reference electrode. If the difference in CP Potentials is greater than or equal to 500-millivolts, the insulating flange is providing adequate electrical isolation. This test must be performed with all cathodic protection systems and anodes disconnected from the pipeline. If this criterion is not met, perform the Nilsson 400 Meter Direct Resistance Test to verify the effectiveness of the insulating flange.
 2. Direct Resistance Test: Measure the electrical resistance across the insulated flange using a 97-Hertz square wave null balancing ohmmeter such as the Model 400 Nilsson Soil Resistance Meter and the four-wire resistance technique. A standard handheld digital multi-test meter's ohmmeter circuit (e.g. Fluke 97 or Beckman HD110) is not suitable for properly making these resistance measurements. Perform this test by connecting the meter's P1 and C1 terminals to one side of the insulating flange, using two wires, and then connecting the meter's P2 and C2 terminals to the other side of the insulating flange, using two additional wires. Use vise grips or temporary exothermic welds to make the wire connections to the flange or pipe. The criterion for a pipe filled with water is a minimum measurement of 5-Ohms. The criterion for a dry or a partially filled pipe is a minimum measurement of 100-Ohms. If none of the applicable criteria are met, perform the Inductive Ammeter Direct Resistance Test to verify the effectiveness of the insulating flange.
 3. Inductive Ammeter Direct Resistance Test: Connect two separate wires via two separate connections to the pipe on both sides of the insulating flange. Use vise grips or temporary exothermic welds to make the wire connections. Use two pairs of test wires, one for current flow, one for voltage measurement. Using the first set of test wires, apply a minimum 12-volt DC electrical current across the insulating flange. Using the second set of test wires, measure the voltage across

the insulating flange developed by the DC current flow. Use an inductive ammeter hoop (e.g. Swain hoop) clamped around the pipe immediately adjacent to the insulating flange to measure the change in DC current flow in the pipe, through the insulated flange. Calculate the electrical resistance across the insulating flange in Ohms by dividing the change in DC Volts by the change in DC Amps (i.e. Ohm's Law). The criterion for a pipe filled with water is a minimum measurement of 5-Ohms. The criterion for a dry pipe is a minimum measurement of 100-Ohms. If either of the applicable criteria is not met, perform the NACE Insulating Flange Leakage Test, per NACE SP0286, to verify the effectiveness of the insulating flange.

4. NACE Insulating Flange Leakage Test: This test procedure shall conform to the "Leakage Test" described in the NACE Standard SP0286, Section 8, "Field Testing and Maintenance", Figure 12. The test current used shall be between 3 and 5 DC Amps. The criterion for a pipe filled with water is a maximum "electrical leakage value" of 10-percent of the test current. The criterion for a dry pipe is a maximum "electrical leakage value" of 5-percent of the test current.
- D. Individual Flange Bolt Testing: For all insulated flanges to be buried and for all other insulating flanges that do not meet any of the other criteria, measure the electrical resistance of each flange bolt to both sides of the insulated flange using a Nilsson Model 400 Soil Resistance Meter and four-wire resistance technique. The measured resistance value for each flange through-bolt shall be a minimum of 1,000-Ohms, as measured from each bolt to both flanges. This criterion applies to the flange through-bolts and does not apply to valve cap bolts which are threaded on one side. Remove, inspect, and replace all dielectric flange bolt sleeves and washers that do not meet the minimum resistance criterion.
 - E. If an insulated flange with threaded cap bolts passes the resistance tests for all the "through-bolts" yet fails the other previous tests, remove all the threaded cap bolts, inspect and replace all imperfect dielectric flange bolt sleeve and washer materials and retest.
 - F. In order to make an accurate resistance measurement that passes any of these criteria it may be necessary to disable the pipe inside a vault, flow control facility, or pump station on one side of the insulated flange (or temporarily remove any electrically grounded appurtenances) so that the pipe is not grounded on one side of the insulated flange. This temporary change may eliminate an electrical path which interferes with making an accurate resistance measurement.
- PART 4 - Insulating joints shall be installed to effectively isolate metallic piping from foreign metallic structures. The CONTRACTOR shall test the performance of these insulating joints before and after backfill.
- A. Before backfill, the CONTRACTOR shall test the insulating joint using a Gas Electronics Model No. 601 Insulation Checker, or approved equivalent. If the testing results indicate less than 100% insulation, the insulating joints shall be repaired and retested at the CONTRACTOR's expense.
 - B. After backfill, testing shall be performed by measurement of native pipe-to-soil potentials at both sides of the insulating joint. If the difference in native pipe-to-soil potentials on both sides of the insulating joint is within +/-50 milliVolts, then additional testing shall be performed as follows. Temporary cathodic protection current shall be circulated on the project pipeline side of the insulating joint. "On" and "Instant Off" pipe-to-soil potentials shall be measured on the other side of the insulating joint. If the "Instant Off" potential is more negative than the native potential, the insulating joint shall be considered deficient and shall be repaired and retested at the CONTRACTOR's

expense.

4.2 ELECTRICAL ISOLATION TESTING BETWEEN PIPE AND STEEL REINFORCEMENT CASING INSULATORS

- A. Conduct visual and electrical testing at all steel pipe penetrations through reinforced concrete structures before and after the concrete is placed. This testing is required to demonstrate that all buried steel pipe is not in contact with any metallic objects embedded in the concrete wall, concrete slab, or structural concrete pipe encasements. The embedded objects to be verified for metallic isolation from steel pipe include all of the following:
1. rebar
 2. rebar tie wire
 3. snap ties
 4. shebolts
 5. tie rods
 6. taper ties
 7. dowels
- B. Perform this testing no more than 1 day before each concrete placement and no more than 1 day after each concrete placement. Correct all direct contacts detected between sections of pipe to be buried and concrete reinforcing components by trimming or repositioning the reinforcement components. If pipe to reinforcement contacts are detected after concrete is in place, use chipping hammers and other concrete demolition tools to remove as much concrete as is necessary to eliminate all metallic points of contact with the steel pipe. This metallic isolation testing shall be performed by the Contractor's Cathodic Protection Engineer or Technician and witnessed by the Engineer. A representative from the City of San Diego, Water System Operations, Corrosion Section shall be notified a minimum of 7 days before the first pipe-vault penetration concrete is placed in order to review the equipment and test procedure to be used and to witness the contractor actually performing the tests. The failure for a new buried steel pipeline to pass this electrical isolation test may require concrete and reinforcing steel to be incrementally demolished by the contractor at no cost to the City of San Diego until the new steel pipeline passes the electrical isolation test.
- C. Perform all electrical resistance measurements for this test using a 97-Hertz square wave null balancing ohmmeter such as the Nilsson Model 400 Soil Resistance Meter or the MC Miller Model 400A and the four-wire resistance technique to compensate for the test wire and connection resistances. A standard handheld digital multi-test meter's ohmmeter circuit (e.g. Fluke 87) is not suitable for properly making these resistance measurements. Perform this test by connecting the meter's P1 and C1 terminals to the pipe, using two different wires and two different connections, and then connecting the meter's P2 and C2 terminals to the rebar, using two additional wires and connections. Use vise grips or temporary exothermic welds to make the wire connections to the pipe and rebar.
- D. Rebar Ground Cable Connections at Pipe Encasements and Vault Penetrations: Select two exposed pieces of rebar separated by at least 2 feet that are wire tied to a minimum of 6 other perpendicular pieces of rebar for use as electrical ground reference test points. Using temporary connections such as vice grips or other compression clamps measure the electrical resistance between the two different pieces of rebar to ensure that the rebar test points are electrically continuous with the bulk of the rebar in the concrete structure. If either piece of rebar is not securely wire tied to all the other rebar

in the encasement or vault, then the electrical resistance measurement will yield erroneous or misleading data. A maximum resistance of 0.10 Ohm between the two rebar test points is required before continuing with the electrical isolation test. Connect two unspliced lengths of minimum size #6 AWG bare copper stranded grounding cable to two different pieces of rebar. Each ground cable connection to the rebar shall be made with a separate exothermic weld or a separate mechanical compression ground clamp.

- E. Direct Resistance Isolation Test: Testing shall first be performed using the Direct Resistance Test. Attach one pair of the resistance test leads to the pipe and one pair of resistance test leads to the rebar then measure the pipe to rebar resistance. If the resistance is 10 Ohms or more, the pipe is sufficiently electrically isolated from the rebar. If the test reading is less than 10 Ohms, proceed with the Steel Polarization Isolation Test described below.
- F. Steel Polarization Isolation Test:
 - 1. Step 1: Measure the baseline CP potentials of the buried pipeline and of the rebar using a stationary location for a copper sulfate reference electrode. Place the reference electrode in soil at an offset distance from the pipeline equal to approximately the length or width (whichever is greater) of the concrete structure under construction. If the difference between the readings of the pipe and rebar is 500 millivolts DC or more, that indicates sufficient electrical isolation. This test must be done with all nearby sources of cathodic protection electrical current turned off or disconnected, and with all welding equipment turned off. If the difference is less than 500 millivolts DC, record the baseline CP Potentials and proceed to the next step.
 - 2. Step 2: Set up a temporary DC power source such as a truck battery, a minimum 300 Watt, 2 to 4 Ohm, power rheostat, a calibrated electrical shunt, and two minimum #6 AWG test cables. Set up the DC power source with the positive cable connected to the rebar and the negative cable connected to the pipe. Initially adjust the rheostat for the largest resistance/smallest current and measure the current flow. Adjust the electrical power to a minimum current of 1 DC Amp, maximum of 10 DC Amps. Allow the DC current to flow for a minimum of 5 minutes then shut off the test current.
 - 3. Step 3: Remeasure CP Potentials of the pipe and rebar using the same reference electrode in the same location with the test current off. These are called polarized CP potentials.
 - 4. Step 4: Compare the polarized CP Potentials with the previously measured baseline CP Potentials. If the pipe is electrically isolated from the rebar, the test current will polarize the buried pipeline's steel cathodically (i.e. a more negative CP Potential) and shift the rebar anodically (i.e. a more positive CP Potential). If the difference between the polarized potentials of the pipeline and rebar is less than 300 millivolts DC there are one or more metallic contacts between the buried pipeline and the rebar. If the difference is 300 millivolts DC or greater the steel pipeline is sufficiently electrically isolated from the rebar.
- G. If a Contractor wishes to use an alternate test procedure, prepare a written test procedure specifying the methods and equipment that will be used. Submit it to the Engineer for approval a minimum of 30 days before the first concrete placement. In no case shall an electrical resistance measurement made with a hand held volt-ohm multimeter be accepted as an accurate isolation test procedure. In the event of a question regarding the electrical isolation of the pipeline, the Engineer shall make the final determination.

- H. Electrical isolation tests shall be conducted for each pipeline encasement, each pipe to vault penetration, and any other reinforced concrete structure that a pipeline passes through. The electrical isolation tests must be performed by the contractor one day before concrete is placed, and the day after concrete is placed. The Engineer will witness the electrical isolation test conducted before the concrete is placed.
- I. After the pipeline passes the rebar isolation test, direct bury the two bare copper ground cables connected to the rebar to a flush-to-grade concrete ground box near the pipe-vault penetration. Provide a cover for the test box marked "GROUND". Provide a minimum of two (2) feet of extra ground cable inside the rebar ground test box. If there is a nearby cathodic protection test box the rebar ground wires can be run into that box. If the rebar test wires are not long enough to reach the permanent test box, splice additional wire to them using two brass split bolts for each splice. No coating is required for the connections.

4.3 CASING INSULATORS

- A. Need testing for electrical isolation between reinforcing steel and pipe where it ingresses/egresses concrete structures.
- B. Casing insulators shall be installed to effectively isolate the pipeline from the casing. The CONTRACTOR shall test the performance of the casing insulators before and after backfill.
- C. A Conduct visual and electrical testing at all locations where steel pipe is constructed inside steel casings to ensure nonmetallic casing spacers have been installed properly to prevent any metallic contact between the steel pipe and the casing. This testing must be performed as soon as possible after the steel pipe has been inserted into the casing so that the equipment used to move the pipe can be used to reposition the steel pipe if the electrical isolation testing shows metallic contact is occurring.
- D. Perform this testing the same day that each segment of pipe is installed inside the steel casing. Correct all direct contacts detected between sections of steel pipe and casing by repositioning or replacing components of the nonmetallic casing spacers.
- E. If a pipe to casing contact is detected after the pipe is in place inside a casing, reposition or remove the steel pipe to investigate where the metallic contact is occurring. This metallic isolation testing shall be performed by the Contractor's Cathodic Protection Engineer or Technician and witnessed by the Engineer. A representative from the City of San Diego, Water System Operations, Corrosion Section shall be notified a minimum of 7 days before the first pipe is installed inside a steel casing in order to review the equipment and test procedure to be used and to witness the contractor actually performing the tests. The failure for a new steel pipeline to pass this electrical isolation test may require the steel pipe sections to be completely removed from the casing by the contractor at no cost to the City of San Diego in order to correct problems with the nonmetallic casing spacers so that the new steel pipeline passes the electrical isolation test.
- F. Perform all electrical resistance measurements for this test using a 97-Hertz square wave null balancing ohmmeter such as the Nilsson Model 400 Soil Resistance Meter or the MC Miller Model 400A and the four-wire resistance technique to compensate for the test wire and connection resistances. A standard handheld digital multi-test meter's ohmmeter circuit (e.g. Fluke 87) is not suitable for properly making these resistance measurements. Perform this test by connecting the meter's P1 and C1 terminals to the steel pipe, using two different wires and two different connections, and then connecting the meter's P2 and C2 terminals to the steel casing, using two additional wires and connections. Use vise grips or temporary exothermic welds to make the wire connections to the pipe and casing.

- G. Casing Ground Cable Connections: Connect two unspliced lengths of minimum size #6 AWG copper stranded wire to the casing at any location. Each ground cable connection to the casing shall be made with a separate exothermic weld.
- H. Direct Resistance Isolation Test: Testing shall first be performed using the Direct Resistance Test. Attach one pair of the resistance test leads to the pipe and one pair of resistance test leads to the casing then measure the pipe to casing resistance. If the resistance is 10 Ohms or more, the pipe is sufficiently electrically isolated from the casing. If the test reading is less than 10 Ohms, proceed with the Steel Polarization Isolation Test described below.
- I. Steel Polarization Isolation Test:
 1. Step 1: Measure the baseline CP potentials of the buried pipeline and of the casing using a stationary location for a copper sulfate reference electrode. Place the reference electrode in soil at an offset distance from the pipeline equal to approximately one half of the length of the casing. If the difference between the readings of the pipe and casing is 500 millivolts DC or more, that indicates sufficient electrical isolation. This test must be done with all nearby sources of cathodic protection electrical current turned off or disconnected, and with all welding equipment turned off. If the difference is less than 500 millivolts DC, record the baseline CP Potentials and proceed to the next step.
 2. Step 2: Set up a temporary DC power source such as a truck battery, a minimum 300 Watt, 2 to 4 Ohm, power rheostat, a calibrated electrical shunt, and two minimum #6 AWG test cables. Set up the DC power source with the positive cable connected to the casing and the negative cable connected to the pipe. Initially adjust the rheostat for the largest resistance/smallest current and measure the current flow. Adjust the electrical power to a minimum current of 1 DC Amp, maximum of 10 DC Amps. Allow the DC current to flow for a minimum of 5 minutes then shut off the test current.
 3. Step 3: Remeasure CP Potentials of the pipe and casing using the same reference electrode in the same location with the test current off. These are called polarized CP potentials.
 4. Step 4: Compare the polarized CP Potentials with the previously measured baseline CP Potentials. If the pipe is electrically isolated from the casing, the test current will polarize the buried pipeline's steel cathodically (i.e. a more negative CP Potential) and shift the casing anodically (i.e. a more positive CP Potential). If the difference between the polarized potentials of the pipeline and casing is less than 300 millivolts DC there are one or more metallic contacts between the buried pipeline and the casing. If the difference is 300 millivolts DC or greater the steel pipeline is sufficiently electrically isolated from the casing.
- J. If a Contractor wishes to use an alternate test procedure, prepare a written test procedure specifying the methods and equipment that will be used. Submit it to the Engineer for approval a minimum of 30 days before the first concrete placement. In no case shall an electrical resistance measurement made with a hand held volt-ohm multimeter be accepted as an accurate isolation test procedure. In the event of a question regarding the electrical isolation of the pipeline, the Engineer shall make the final determination.
- K. Electrical isolation tests shall be conducted for each pipe running through a steel casing. The electrical isolation tests must be performed by the contractor the same day that the pipe is inserted into the casing. The Engineer will witness the electrical isolation test.
- L. After the pipeline passes the casing isolation test, direct bury the two bare copper

ground cables connected to the casing to a flush-to-grade concrete ground box near the end of the casing. Provide a cover for the test box marked "GROUND". Provide a minimum of two (2) feet of extra ground cable inside the rebar ground test box. If there is a nearby cathodic protection test box the rebar ground wires can be run into that box. If the rebar test wires are not long enough to reach the permanent test box, splice additional wire to them using two brass split bolts for each splice. No coating is required for the connections.

- M. If the pipe is not isolated from the casing, correct retested at the CONTRACTOR's expense.

PART 5 - Casing insulators shall be installed as indicated in the Drawings to effectively isolate the pipeline from the casing. The CONTRACTOR shall test the performance of the casing insulators before and after backfill.

- A. After backfill, testing shall be performed by measurement of native pipe-to-soil potentials on the pipeline and the casing at both ends of the casing. If the difference in native pipe-to-soil potentials is greater than 50 milliVolts, the casing shall be considered isolated from the pipeline. If the difference in native pipe-to-soil potentials between pipe and casing is less than 50 milliVolts, then additional testing shall be performed as follows. Temporary cathodic protection current shall be applied to the pipeline. "On" and "Instant Off" pipe-to-soil potentials shall be measured on the pipeline and the casing at both ends of the casing. If the "Instant Off" potential of the casing is more negative than the native potential of the casing, the pipe is not isolated from the casing and shall be repaired and retested at the CONTRACTOR's expense.

5.2 CONTINUITY TESTING

- A. Continuity testing of all joints and pipe sections having in-line valves shall be performed by the CONTRACTOR's qualified corrosion technician as defined in this section after backfill. The electrical continuity test may additionally be performed before backfill at the CONTRACTOR's option.
- B. The pipe shall be tested for electrical continuity. Continuity shall be verified using the linear resistance method. The pipe shall be tested in spans that are no less than 250 feet and no more than 1,000 feet. Each test span shall have two test leads connected to the pipe at each end. Existing test stations may be used. A direct current shall be applied through the pipe using two of four test leads. The potential across the test span shall be measured using the other two test leads. The current applied and voltage drop shall be recorded for a minimum of three different current levels.
- C. The theoretical resistance of the pipe shall be calculated. It shall take into account the pipe material, segment length, wall thickness and number of joint bonds within the span.
- D. Acceptance of the test span: The average measured resistance shall be compared to the theoretical resistance of the pipe. If the measured resistance is greater than 120% of the theoretical resistance, then the welded joints shall be considered deficient and shall be repaired and retested at the CONTRACTOR's expense. If the measured resistance is less than 100% of the theoretical resistance then the test and/or calculated theoretical resistance shall be considered deficient and the test span shall be retested and/or recalculated at the CONTRACTOR's expense. If the piping forms a loop which allows current to flow both in and out of the test span, then consideration shall be made for current circulating through both the loop and the test span.

5.3 SYSTEM CHECKOUT

- A. Upon completion of the installation, the CONTRACTOR shall provide testing of the completed system by a qualified corrosion technician. The data shall be reviewed by a Corrosion Engineer to ensure conformance with the Contract Documents, NACE SP0169, and NACE SP0286.

- B. The testing described herein shall be in addition to and not substitution for any required testing of individual items at the Manufacturer's plant and during installation.
- C. Testing shall be performed at all test leads of all test stations and at the locations of exposed pipe as soon as possible after installation of the cathodic protection system.
- D. Testing shall include the following and shall be conducted in accordance with NACE TM0497:
 - 1. Measure and record native pipe-to-soil and casing-to-soil potentials at all test locations.
 - 2. Verify electrical isolation at all insulating joints, insulating unions, and casing insulators per NACE SP0286.
 - 3. Confirm electrical continuity of the pipeline or cathodically protected structure in accordance with this Section.
 - 4. Measure and record the "On" and "Instant Off" potentials at each location.
 - 5. Measure and record the current output of the rectifier and each anode.
- E. Test results shall be analyzed to determine compliance with NACE SP0169.
- F. Test results shall be analyzed to determine if stray current interference is present. Stray current interference is defined as a +/-50 millivolt shift in a pipeline's pipe-to-soil potential that is caused by a foreign current source. Stray current interference shall be tested on the project pipeline and foreign pipelines that have a reasonable chance of being affected by stray currents.
- G. Provide GPS Locations for each test station with submeter accuracy for inclusion in the test report.
- H. The CONTRACTOR shall provide a written report (hard copy and electronic), prepared by the Corrosion Engineer, documenting the results of the testing and recommending corrective work, as required to comply with the Contract Documents. Any deficiencies of systems tested shall be repaired and re-tested by the CONTRACTOR at no additional cost to the OWNER.

** END OF SECTION **

SECTION 16950

ELECTRICAL TESTS

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

- A. The CONTRACTOR shall test, commission and demonstrate that the electrical work satisfies the criteria of these Specifications and functions as required by the Contract Documents.

1.2 GENERAL

- A. The Work of this Section includes furnishing the labor, equipment and power required to support the testing in other Divisions of these Specifications. This scope may require the CONTRACTOR to activate circuits, shutdown circuits, run equipment, make electrical measurements, replace blown fuses, and install temporary jumpers.

1.3 RELATED SECTIONS

- A. The Work of the following Sections applies to the Work of this Section. Other Sections, not referenced below, shall also apply to the extent required for proper performance of this Work.

- 1. Section 16010 - Basic Electrical Requirements

1.4 CODES

- A. The Work of this Section shall comply with the current editions of the National Electrical Code as adopted by the City of San Diego.

1.5 STANDARDS

- A. Except as otherwise indicated, the current editions of the following apply to the Work of this Section:

- 1. NETA National Electrical Testing Association
- 2. ICEA Insulated Cable Engineers Association

1.6 TESTING

- A. The following test requirements are intended to supplement test and acceptance criteria that may be stated elsewhere.

- 1. Test ground interrupter (GFI) receptacles and circuit breakers for proper operation by methods sanctioned by the receptacle manufacturer.

2. A functional test and check of all electrical components is required prior to performing subsystem testing and commissioning. Compartments and equipment shall be cleaned as required by other provisions of these Specifications before commencement of functional testing. Functional testing shall comprise:
 - a. Visual and physical check of cables and connections associated with all new and modified equipment.
 3. Complete ground testing of all grounding electrodes prior to operating the equipment. Use a three-point ground test.)
- B. Subsystem testing shall occur after the proper operation of alarm and status contacts has been demonstrated or otherwise accepted by the Resident Engineer and after process control devices have been adjusted as accurately as possible. It is intended that the CONTRACTOR will adjust limit switches and level switches to their operating points prior to testing.
 - C. Provide ground resistance tests in the presence of the Resident Engineer and submit results. Use a ground resistance meggar "Earth" tester with a maximum of 0-50 scale. Use the full of potential method or the three terminal method as described by Biddle or NETA Standards.
 - D. General: Carry out tests for individual items of materials and equipment indicated in other Sections.
- 1.7 COMMISSIONING
- A. Commissioning shall not be attempted until all subsystems have been found to operate satisfactorily; commissioning shall only be attempted as a function of normal plant operation in which plant process flows and levels are routine and equipment operates automatically in response to flow and level parameters or computer command, as applicable. Simulation of process parameters will be considered only upon receipt of a written request.

PART 2 -- PRODUCTS (Not Used)

PART 3 -- EXECUTION (Not Used)

**** END OF SECTION ****

SUPPLEMENTARY SPECIAL PROVISIONS
APPENDICES

APPENDIX A

**FINAL MITIGATED NEGATIVE DECLARATION, NOTICE OF DETERMINATION AND
NOTICE OF EXEMPTION**



(619) 446-5460

**FINAL MITIGATED
NEGATIVE DECLARATION**

PTS No. 406277

WBS No. S-11026.02.06

SCH. No.: 2015111024

SUBJECT: MONTEZUMA PIPELINE/MID-CITY PIPELINE PHASE 2: A SITE DEVELOPMENT PERMIT for the installation of approximately 1.16 miles of new water pipelines which consists of 5,680 linear feet (LF) of new 66" diameter Cement Lined and Coated Steel transmission main and 422 LF of 8-inch PVC distribution main. The 66-inch transmission main will run from the Alvarado Water Treatment Plant (AWTP), located at the intersection of Lake Murray Boulevard and Kiowa Drive, to the intersection of 68th Street and El Cajon Boulevard. The northern terminus of the pipeline will be connected to Existing Valve Vault No. 3 located where the Earl Thomas Reservoir Outlet Pipeline intersects the Clear Wells Interconnect Pipeline at the AWTP. The south terminus will be connected to the Mid-City Pipeline Phase 1 project water lines which start on El Cajon Boulevard between 68th and 69th Streets. The project also includes replacement of a remote control panel and antenna mast for the Murray 2nd Pipeline, as well as installation of insert flow meters for the Murray 2nd Pipeline and the Mid-City Pipeline. The majority of the project alignment will be constructed using open trenching. The pipeline will be tunneled and no trenching will be required at three locations: 1) crossing Interstate 8; 2) under the San Diego County Water Authority 108-inch main on Lake Murray Boulevard; and 3) under the San Diego County Water Authority 48-inch main on El Cajon Boulevard. For the I-8 crossing, the tunnel launching pit will be located in the Denny's parking lot at 6970 Alvarado Road on the south side of I-8, and the receiving pit will be on the north side of I-8 in the City of La Mesa within the Lake Murray Boulevard public right-of-way. Both tunneling pits will be sited in existing development areas that do not contain sensitive biological resources.

There will be excavations in unpaved areas at the connection with Valve Vault No. 3 at the AWTP and at the Murray 2nd Pipeline. Existing Valve Vault No. 3 is on City owned land adjacent to Lake Murray Boulevard. The excavation for the Murray 2nd Pipeline is partially within a Multiple Habitat Preservation Area. It is on City owned property near the Del Cerro Baptist Church at the intersection of Pennsylvania Lane and Delaware Avenue. Related work will include traffic control, best management practices for erosion control and storm drain inlet protection, ADA curb ramp installation, pipe abandonment, and resurfacing and restoration of disturbed areas to their original condition. Existing below grade water line will be abandoned along portions of Mohawk Street, 72nd Street, and a public alley north of Mohawk Street.

Applicant: City of San Diego Public Works Department – Engineering and Capital Projects, Architectural Engineering & Parks Division.

I. PROJECT DESCRIPTION: See attached Initial Study.

- II. ENVIRONMENTAL SETTING: See attached Initial Study.
- III. DETERMINATION: The City of San Diego conducted an Initial Study which determined that the proposed project could have a significant environmental affect in the following area(s): **Land Use (MSCP/MHPA Adjacency), Biological Resources, Archaeological Resources and Paleontological Resources.** Subsequent revisions in the project proposal create the specific mitigation identified in Section V of this Mitigated Negative Declaration (MND). The project, as revised, now avoids or mitigates the potentially significant environmental effects previously identified, and the preparation of an Environmental Impact Report will not be required.
- IV. DOCUMENTATION: The attached Initial Study documents the reasons to support the above Determination.
- V. MITIGATION, MONITORING AND REPORTING PROGRAM: To ensure that site development would avoid significant environmental impacts, a Mitigation, Monitoring, and Reporting Program (MMRP) is required. Compliance with the mitigation measures shall be the responsibility of the applicant. The mitigation measures are described below.
- A. GENERAL REQUIREMENTS – PART I**
Plan Check Phase (prior to permit issuance)
1. Prior to the issuance of a Notice To Proceed (NTP) for a subdivision, or any construction permits, such as Demolition, Grading or Building, or beginning any construction related activity on-site, the Development Services Department (DSD) Director’s Environmental Designee (ED) shall review and approve all Construction Documents (CD), (plans, specification, details, etc.) to ensure the MMRP requirements are incorporated into the design.
 2. In addition, the ED shall verify that the MMRP Conditions/Notes that apply ONLY to the construction phases of this project are included VERBATIM, under the heading, **“ENVIRONMENTAL/MITIGATION REQUIREMENTS.”**
 3. These notes must be shown within the first three (3) sheets of the construction documents in the format specified for engineering construction document templates as shown on the City website:
<http://www.sandiego.gov/development-services/industry/standtemp.shtml>
 4. The **TITLE INDEX SHEET** must also show on which pages the “Environmental/Mitigation Requirements” notes are provided.
 5. **SURETY AND COST RECOVERY** – The Development Services Director or City Manager may require appropriate surety instruments or bonds from private Permit Holders to ensure the long term performance or implementation of required mitigation measures or programs. The City is authorized to recover its cost to offset the salary, overhead, and expenses for City personnel and programs to monitor qualifying projects.

B. GENERAL REQUIREMENTS – PART II

Post Plan Check (After permit issuance/Prior to start of construction)

- 1. PRE CONSTRUCTION MEETING IS REQUIRED TEN (10) WORKING DAYS PRIOR TO BEGINNING ANY WORK ON THIS PROJECT.** The PERMIT HOLDER/OWNER is responsible to arrange and perform this meeting by contacting the CITY RESIDENT ENGINEER (RE) of the Field Engineering Division and City staff from MITIGATION MONITORING COORDINATION (MMC). Attendees must also include the Permit holder's Representative(s), Job Site Superintendent and the following consultants:

Qualified Biologist

Qualified Paleontologist

Qualified Archaeologist

Qualified Native American Monitor, Viejas Band of Kumeyaay Indians

Note: Failure of all responsible Permit Holder's representatives and consultants to attend shall require an additional meeting with all parties present.

CONTACT INFORMATION:

- a) The PRIMARY POINT OF CONTACT is the **RE** at the **Field Engineering Division – 858-627-3200**
- b) For Clarification of ENVIRONMENTAL REQUIREMENTS, it is also required to call **RE and MMC at 858-627-3360**

- 2. MMRP COMPLIANCE:** This Project, Project Tracking System (PTS) 406277, shall conform to the mitigation requirements contained in the associated Environmental Document and implemented to the satisfaction of the DSD's Environmental Designee (MMC) and the City Engineer (RE). The requirements may not be reduced or changed but may be annotated (i.e. to explain when and how compliance is being met and location of verifying proof, etc.). Additional clarifying information may also be added to other relevant plan sheets and/or specifications as appropriate (i.e., specific locations, times of monitoring, methodology, etc)

Note: Permit Holder's Representatives must alert RE and MMC if there are any discrepancies in the plans or notes, or any changes due to field conditions. All conflicts must be approved by RE and MMC BEFORE the work is performed.

- 3. OTHER AGENCY REQUIREMENTS:** Evidence of compliance with all other agency requirements or permits shall be submitted to the RE and MMC for review and acceptance prior to the beginning of work or within one week of the Permit Holder obtaining documentation of those permits or requirements. Evidence shall include copies of permits, letters of resolution or other documentation issued by the responsible agency.

City of La Mesa Encroachment Permits

Caltrans Encroachment Permits

- 4. MONITORING EXHIBITS:** All consultants are required to submit, to RE and MMC, a monitoring exhibit on a 11x17 reduction of the appropriate construction plan, such as site plan,

grading, landscape, etc., marked to clearly show the specific areas including the **LIMIT OF WORK**, scope of that discipline’s work, and notes indicating when in the construction schedule that work will be performed. When necessary for clarification, a detailed methodology of how the work will be performed shall be included.

NOTE: Surety and Cost Recovery – When deemed necessary by the Development Services Director or City Manager, additional surety instruments or bonds from the private Permit Holder may be required to ensure the long term performance or implementation of required mitigation measures or programs. The City is authorized to recover its cost to offset the salary, overhead, and expenses for City personnel and programs to monitor qualifying projects.

5. OTHER SUBMITTALS AND INSPECTIONS: The Permit Holder/Owner’s representative shall submit all required documentation, verification letters, and requests for all associated inspections to the RE and MMC for approval per the following schedule:

Document Submittal/Inspection Checklist

<i>Issue Area</i>	<i>Document submittal</i>	<i>Assoc Inspection/Approvals/ Notes</i>
General	Consultant Qualification Letters	Prior to Pre-construction Meeting
General	Consultant Const. Monitoring Exhibits	Prior to or at the Pre-Construction Meeting
Biology	Biology Report	Prior to Construction – Limits of Work (Verification – Project Site)
Archaeology	Archaeology Reports	Archaeology Site Observation
Paleontology	Paleontology Reports	Paleontology Site Observation
Final MMRP		Final MMRP Inspections

C. SPECIFIC MMRP ISSUE AREA CONDITIONS/REQUIREMENTS

BIOLOGICAL RESOURCES

I. Prior to the issuance of a Notice to Proceed (NTP) or any construction permits, including but not limited to, the first Grading Permit, Demolition Plans/Permits and Building Plans/Permits the Development Services Department Deputy Director (DD) environmental designee Mitigation Monitoring Coordination (MMC) shall incorporate the following mitigation measures into the project design and include them verbatim on all appropriate construction documents.

Letters of Qualification Have Been Submitted to DD

1. The applicant shall submit, for approval, a letter verifying the qualifications of the biological professional to MMC. This letter shall identify the Principal Qualified Biologist (PQB) and Qualified Biological Monitor (QBM) and the names of all other persons involved in the implementation of the biological monitoring program, as they are defined in the City of San Diego Biological Review References. Resumes and the biology worksheet should be updated annually.
2. *MMC will provide a letter to the applicant confirming the qualifications of the PQB /QBM and all City approved persons involved in the biological monitoring of the project.*
3. Prior to the start of work, the applicant must obtain approval from MMC for any personnel changes associated with the biological monitoring of the project.

II. Prior to Start of Construction

A. PQB Shall Attend Preconstruction (Precon) Meetings

1. Prior to beginning any work that requires monitoring:
 - a. The owner/permittee or their authorized representative shall arrange and perform a Precon Meeting that shall include the PQB, Construction Manager (CM) and/or Grading Contractor (GC), Landscape Architect (LA), Revegetation Installation Contractor (RIC), Revegetation Maintenance Contractor (RMC), Resident Engineer (RE), Building Inspector (BI), if appropriate, and MMC.
 - b. The PQB shall also attend any other grading/excavation related Precon Meetings to make comments and/or suggestions concerning the biological monitoring program.
 - c. If the PQB is unable to attend the Precon Meeting, the owner shall schedule a focused Precon Meeting with MMC, PQB, CM, BI, LA, RIC, RMC, RE and/or BI, if appropriate, prior to the start of any work associated with the revegetation/ restoration phase of the project, including site grading preparation.
2. When Biological Monitoring Will Occur
 - a. Prior to the start of any work, the PQB shall also submit a monitoring procedures schedule to MMC and the RE indicating when and where biological monitoring and related activities will occur.
3. PQB Shall Contact MMC to Request Modification
 - a. The PQB may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information (such as other sensitive species not listed by federal and/or state agencies and/or not covered by the MSCP and to which any impacts may be considered significant under CEQA) which may reduce or increase the potential for biological resources to be present.

III. During Construction

A. PQB or QBM Present During Construction/Grading/Planting

1. The PQB or QBM shall be present full-time during construction activities including but not limited to, site preparation, cleaning, grading, and excavation, in association with the construction of the project which could result in impacts to sensitive biological resources as identified in the LCD and on the RRME. **The QBM is responsible for notifying the PQB of changes to any approved construction plans, procedures, and/or activities. The PQB is responsible to notify MMC of the changes.**
2. The PQB or QBM shall document field activity via the Consultant Site Visit Record Forms (CSVSR). The CSVSR's shall be faxed by the CM the first day of monitoring, the last day of monitoring, monthly, and in the event that there is a deviation from conditions identified within the LCD and/or biological monitoring program. The RE shall forward copies to MMC.
3. The PQB or QBM shall be responsible for maintaining and submitting the CSVSR at the time that CM responsibilities end (i.e., upon the completion of construction activity other than that of associated with biology).
4. All construction activities (including staging areas) shall be restricted to the development areas. The PQB or QBM staff shall monitor construction activities as needed, with MMC concurrence on method and schedule. This is to ensure that construction activities do not encroach into biologically sensitive areas beyond the limits of disturbance.

5. The PQB or QBM shall supervise the placement of orange construction fencing or City approved equivalent, along the limits of potential disturbance adjacent to (or at the edge of) all sensitive habitats.
 6. The PBQ shall provide a letter to MMC that limits of potential disturbance has been surveyed, staked and that the construction fencing is installed properly
 7. The PQB or QBM shall oversee implementation of BMP's, such as gravel bags, straw logs, silt fences or equivalent erosion control measures, as needed to ensure prevention of any significant sediment transport. In addition, the PQB/QBM shall be responsible to verify the removal of all temporary construction BMP's upon completion of construction activities. Removal of temporary construction BMP's shall be verified in writing on the final construction phase CSV.
 8. PQB shall verify in writing on the CSV's that no trash stockpiling or oil dumping, fueling of equipment, storage of hazardous wastes or construction equipment/material, parking or other construction related activities shall occur adjacent to sensitive habitat. These activities shall occur only within the designated staging area located outside the area defined as biological sensitive area.
- B. Disturbance/Discovery Notification Process
1. If unauthorized disturbances occurs or sensitive biological resources are discovered that were not previously identified, the PQB or QBM shall direct the contractor to temporarily divert construction in the area of disturbance or discovery and immediately notify the RE or BI, as appropriate.
 2. The PQB shall also immediately notify MMC by telephone of the disturbance and report the nature and extent of the disturbance and recommend the method of additional protection, such as fencing and appropriate Best Management Practices (BMP's). After obtaining concurrence with MMC and the RE, PQB and CM shall install the approved protection and agreement on BMP's.
 3. The PQB shall also submit written documentation of the disturbance to MMC within 24 hours by fax or email with photos of the resource in context (e.g., show adjacent vegetation).
- C. Determination of Significance
1. The PQB shall evaluate the significance of disturbance and/or discovered biological resource and provide a detailed analysis and recommendation in a letter report with the appropriate photo documentation to MMC to obtain concurrence and formulate a plan of action which can include fines, fees, and supplemental mitigation costs.
 2. MMC shall review this letter report and provide the RE with MMC's recommendations and procedures.

IV. General Bird Mitigation

To avoid any direct impacts to raptors and/or any native/migratory birds, removal of habitat that supports active nests in the proposed area of disturbance should occur outside of the breeding season for these species (February 1 to September 15). If removal of habitat in the proposed area of disturbance must occur during the breeding season, the Qualified Biologist shall conduct a pre-construction survey to determine the presence or absence of nesting birds on the proposed area of disturbance. The pre-construction (precon) survey shall be conducted within 10 calendar days prior to the start of construction activities (including removal of vegetation). The applicant shall submit the results of the precon survey to City DSD for review and approval prior to initiating any construction activities. If nesting birds are detected, a letter report or mitigation plan in conformance with the City's Biology Guidelines and applicable State and Federal Law (i.e. appropriate follow up surveys, monitoring schedules, construction and noise barriers/buffers, etc.) shall be prepared and include

proposed measures to be implemented to ensure that take of birds or eggs or disturbance of breeding activities is avoided. The report or mitigation plan shall be submitted to the City DSD for review and approval and implemented to the satisfaction of the City. The City's MMC Section or RE, and Biologist shall verify and approve that all measures identified in the report or mitigation plan are in place prior to and/or during construction. If nesting birds are not detected during the precon survey, no further mitigation is required.

V. Cooper's Hawk

If work is conducted during the breeding season (February 1 – September 15), a pre-construction survey for Cooper's hawk nests shall be conducted to determine the exact location of a Cooper's hawk nesting site. If a Cooper's hawk nesting site is identified in proximity to the project site/impact area, a 300-foot avoidance area from the Cooper's hawk nest site shall be established and monitored by a qualified biologist to ensure normal Cooper's hawk nest chronology for the subject nest site throughout the project construction activity period. No work may occur within 300 feet of identified Cooper's hawk nests until the young have fledged and the nest is no longer active.

MSCP SUBAREA PLAN -LAND USE ADJACENCY REQUIREMENTS

- I. Prior to issuance of any construction permit or notice to proceed, DSD/ LDR, and/or MSCP staff shall verify the Applicant has accurately represented the project's design in or on the Construction Documents (CD's/CD's consist of Construction Plan Sets for Private Projects and Contract Specifications for Public Projects) are in conformance with the associated discretionary permit conditions and Exhibit "A", and also the City's Multi-Species Conservation Program (MSCP) Multi-Habitat Planning Area (MHPA) Land Use Adjacency Guidelines. The applicant shall provide an implementing plan and include references on/in CD's of the following:
 - A. **Grading/Land Development/MHPA Boundaries** - MHPA boundaries on-site and adjacent properties shall be delineated on the CDs. DSD Planning and/or MSCP staff shall ensure that all grading is included within the development footprint, specifically manufactured slopes, disturbance, and development within or adjacent to the MHPA. For projects within or adjacent to the MHPA, all manufactured slopes associated with site development shall be included within the development footprint.
 - B. **Drainage** - All new and proposed parking lots and developed areas in and adjacent to the MHPA shall be designed so they do not drain directly into the MHPA. All developed and paved areas must prevent the release of toxins, chemicals, petroleum products, exotic plant materials prior to release by incorporating the use of filtration devices, planted swales and/or planted detention/desiltation basins, or other approved permanent methods that are designed to minimize negative impacts, such as excessive water and toxins into the ecosystems of the MHPA.
 - C. **Toxics/Project Staging Areas/Equipment Storage** - Projects that use chemicals or generate by-products such as pesticides, herbicides, and animal waste, and other substances that are potentially toxic or impactive to native habitats/flora/fauna (including water) shall incorporate measures to reduce impacts caused by the application and/or drainage of such materials into the MHPA. No trash, oil, parking, or other construction/development-related material/activities shall be allowed outside any approved construction limits. Where applicable, this requirement shall be incorporated

into leases on publicly-owned property when applications for renewal occur. Provide a note in/on the CD's that states: *"All construction related activity that may have potential for leakage or intrusion shall be monitored by the Qualified Biologist/Owners Representative or Resident Engineer to ensure there is no impact to the MHPA."*

- D. **Lighting** - Lighting within or adjacent to the MHPA shall be directed away/shielded from the MHPA and be subject to City Outdoor Lighting Regulations per LDC Section 142.0740.
- E. **Barriers** - New development within or adjacent to the MHPA shall be required to provide barriers (e.g., non-invasive vegetation; rocks/boulders; 6-foot high, vinyl-coated chain link or equivalent fences/walls; and/or signage) along the MHPA boundaries to direct public access to appropriate locations, reduce domestic animal predation, protect wildlife in the preserve, and provide adequate noise reduction where needed.
- F. **Invasives** - No invasive non-native plant species shall be introduced into areas within or adjacent to the MHPA.
- G. **Brush Management** -New development adjacent to the MHPA shall be set back from the MHPA to provide required Brush Management Zone 1 area on the building pad outside of the MHPA. Zone 2 may be located within the MHPA provided the Zone 2 management will be the responsibility of an HOA or other private entity except here narrow wildlife corridors require it to be located outside of the MHPA. Brush management zones will not be greater in size than currently required by the City's regulations, the amount of woody vegetation clearing shall not exceed 50 percent of the vegetation existing when the initial clearing is done and vegetation clearing shall be prohibited within native coastal sage scrub and chaparral habitats from March 1-August 15 except where the City ADD/MMC has documented the thinning would be consist with the City's MSCP Subarea Plan. Existing and approved projects are subject to current requirements of Municipal Code Section 142.0412.
- H. **Noise** - Due to the site's location adjacent to or within the MHPA where the Qualified Biologist has identified potential nesting habitat for listed avian species, construction noise that exceeds the maximum levels allowed shall be avoided during the breeding seasons for the following: California Gnatcatcher(3/1-8/15). If construction is proposed during the breeding season for the species, U.S. Fish and Wildlife Service protocol surveys shall be required in order to determine species presence/absence. If protocol surveys are not conducted in suitable habitat during the breeding season for the aforementioned listed species, presence shall be assumed with implementation of noise attenuation and biological monitoring.

When applicable (i.e., habitat is occupied or if presence of the covered species is assumed), adequate noise reduction measures shall be incorporated as follows:

COASTAL CALIFORNIA GNATCATCHER (State Species of Special Concern/Federally Threatened)

Prior to the preconstruction meeting, the City Manager (or appointed designee) shall verify that the Multi-Habitat Planning Area (MHPA) boundaries and the following project requirements regarding the coastal California gnatcatcher are shown on the construction plans:

NO MECHANIZED CLEARING, GRUBBING, GRADING, OR OTHER CONSTRUCTION ACTIVITIES SHALL OCCUR BETWEEN MARCH 1 AND AUGUST 15, THE BREEDING SEASON OF THE COASTAL CALIFORNIA GNATCATCHER UNTIL THE FOLLOWING REQUIREMENTS HAVE BEEN MET TO THE SATISFACTION OF THE CITY MANAGER:

- A. A QUALIFIED BIOLOGIST (POSSESSING A VALID ENDANGERED SPECIES ACT SECTION 10(A)(1)(A) RECOVERY PERMIT) SHALL SURVEY THOSE HABITAT AREAS WITHIN THE MHPA THAT WOULD BE SUBJECT TO CONSTRUCTION NOISE LEVELS EXCEEDING 60 DECIBELS [DB(A)] HOURLY AVERAGE FOR THE PRESENCE OF THE COASTAL CALIFORNIA GNATCATCHER. SURVEYS FOR THE COASTAL CALIFORNIA GNATCATCHER SHALL BE CONDUCTED PURSUANT TO THE PROTOCOL SURVEY GUIDELINES ESTABLISHED BY THE U.S. FISH AND WILDLIFE SERVICE WITHIN THE BREEDING SEASON PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. IF GNATCATCHERS ARE PRESENT, THEN THE FOLLOWING CONDITIONS MUST BE MET:
1. BETWEEN MARCH 1 AND AUGUST 15, NO CONSTRUCTION ACTIVITIES SHALL OCCUR WITHIN ANY PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES WOULD RESULT IN NOISE LEVELS EXCEEDING 60 DB(A) HOURLY AVERAGE AT THE EDGE OF OCCUPIED GNATCATCHER HABITAT. AN ANALYSIS SHOWING THAT NOISE GENERATED BY CONSTRUCTION ACTIVITIES WOULD NOT EXCEED 60 DB(A) HOURLY AVERAGE AT THE EDGE OF OCCUPIED HABITAT MUST BE COMPLETED BY A QUALIFIED ACOUSTICIAN (POSSESSING CURRENT NOISE ENGINEER LICENSE OR REGISTRATION WITH MONITORING NOISE LEVEL EXPERIENCE WITH LISTED ANIMAL SPECIES) AND APPROVED BY THE CITY MANAGER AT LEAST TWO WEEKS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES. PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES DURING THE BREEDING SEASON, AREAS RESTRICTED FROM SUCH ACTIVITIES SHALL BE STAKED OR FENCED UNDER THE SUPERVISION OF A QUALIFIED BIOLOGIST; OR
 2. AT LEAST TWO WEEKS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES, UNDER THE DIRECTION OF A QUALIFIED ACOUSTICIAN, NOISE ATTENUATION MEASURES (E.G., BERMS, WALLS) SHALL BE IMPLEMENTED TO ENSURE THAT NOISE LEVELS RESULTING FROM CONSTRUCTION ACTIVITIES WILL NOT EXCEED 60 DB(A) HOURLY AVERAGE AT THE EDGE OF HABITAT OCCUPIED BY THE COASTAL CALIFORNIA GNATCATCHER. CONCURRENT WITH THE COMMENCEMENT OF CONSTRUCTION ACTIVITIES AND THE CONSTRUCTION OF NECESSARY NOISE ATTENUATION FACILITIES, NOISE MONITORING* SHALL BE CONDUCTED AT THE EDGE OF THE OCCUPIED HABITAT AREA TO ENSURE THAT NOISE LEVELS DO NOT EXCEED 60 DB(A) HOURLY AVERAGE. IF THE NOISE ATTENUATION TECHNIQUES IMPLEMENTED ARE DETERMINED TO BE INADEQUATE BY THE QUALIFIED ACOUSTICIAN OR BIOLOGIST, THEN THE

ASSOCIATED CONSTRUCTION ACTIVITIES SHALL CEASE UNTIL SUCH TIME THAT ADEQUATE NOISE ATTENUATION IS ACHIEVED OR UNTIL THE END OF THE BREEDING SEASON (AUGUST 16).

* Construction noise monitoring shall continue to be monitored at least twice weekly on varying days, or more frequently depending on the construction activity, to verify that noise levels at the edge of occupied habitat are maintained below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. If not, other measures shall be implemented in consultation with the biologist and the City Manager, as necessary, to reduce noise levels to below 60 dB(A) hourly average or to the ambient noise level if it already exceeds 60 dB(A) hourly average. Such measures may include, but are not limited to, limitations on the placement of construction equipment and the simultaneous use of equipment.

- B. IF COASTAL CALIFORNIA GNATCATCHERS ARE NOT DETECTED DURING THE PROTOCOL SURVEY, THE QUALIFIED BIOLOGIST SHALL SUBMIT SUBSTANTIAL EVIDENCE TO THE CITY MANAGER AND APPLICABLE RESOURCE AGENCIES WHICH DEMONSTRATES WHETHER OR NOT MITIGATION MEASURES SUCH AS NOISE WALLS ARE NECESSARY BETWEEN MARCH 1 AND AUGUST 15 AS FOLLOWS:
1. IF THIS EVIDENCE INDICATES THE POTENTIAL IS HIGH FOR COASTAL CALIFORNIA GNATCATCHER TO BE PRESENT BASED ON HISTORICAL RECORDS OR SITE CONDITIONS, THEN THE REQUIREMENTS UNDER SECTION A SHALL BE ADHERED TO AS SPECIFIED ABOVE.
 2. IF THIS EVIDENCE CONCLUDES THAT NO IMPACTS TO THIS SPECIES ARE ANTICIPATED, NO FURTHER MITIGATION MEASURES ARE NECESSARY.

ARCHAEOLOGICAL RESOURCES

I. Prior to Permit Issuance or Bid Opening/Bid Award

A. Entitlements Plan Check

1. Prior to permit issuance or Bid Opening/Bid Award, whichever is applicable, the Assistant Deputy Director (ADD) Environmental designee shall verify that the requirements for Archaeological Monitoring and Native American monitoring have been noted on the applicable construction documents through the plan check process.

B. Letters of Qualification have been submitted to ADD

1. Prior to Bid Award, the applicant shall submit a letter of verification to Mitigation Monitoring Coordination (MMC) identifying the Principal Investigator (PI) for the project and the names of all persons involved in the archaeological monitoring program, as defined in the City of San Diego Historical Resources Guidelines (HRG). If applicable, individuals involved in the archaeological monitoring program must have completed the 40-hour HAZWOPER training with certification documentation.
2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the archaeological monitoring of the project meet the qualifications established in the HRG.
3. Prior to the start of work, the applicant must obtain written approval from MMC for any

personnel changes associated with the monitoring program.

II. Prior to Start of Construction

A. Verification of Records Search

1. The PI shall provide verification to MMC that a site specific records search (1/4 mile radius) has been completed. Verification includes, but is not limited to a copy of a confirmation letter from South Coastal Information Center, or, if the search was in-house, a letter of verification from the PI stating that the search was completed.
2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.
3. The PI may submit a detailed letter to MMC requesting a reduction to the ¼ mile radius.

B. PI Shall Attend Precon Meetings

1. Prior to beginning any work that requires monitoring; the Applicant shall arrange a Precon Meeting that shall include the PI, Native American consultant/monitor (where Native American resources may be impacted), Construction Manager (CM) and/or Grading Contractor, Resident Engineer (RE), Building Inspector (BI), if appropriate, and MMC. The qualified Archaeologist and Native American Monitor shall attend any grading/excavation related Precon Meetings to make comments and/or suggestions concerning the Archaeological Monitoring program with the Construction Manager and/or Grading Contractor.
 - a. If the PI is unable to attend the Precon Meeting, the Applicant shall schedule a focused Precon Meeting with MMC, the PI, RE, CM or BI, if appropriate, prior to the start of any work that requires monitoring.
2. Acknowledgement of Responsibility for Curation (CIP or Other Public Projects)
The applicant shall submit a letter to MMC acknowledging their responsibility for the cost of curation associated with all phases of the archaeological monitoring program.
3. Identify Areas to be Monitored
 - a. Prior to the start of any work that requires monitoring, the PI shall submit an Archaeological Monitoring Exhibit (AME) (with verification that the AME has been reviewed and approved by the Native American consultant/monitor when Native American resources may be impacted) based on the appropriate construction documents (reduced to 11x17) to MMC identifying the areas to be monitored including the delineation of grading/excavation limits.
 - b. The AME shall be based on the results of a site specific records search as well as information regarding the age of existing pipelines, laterals and associated appurtenances and/or any known soil conditions (native or formation).
 - c. MMC shall notify the PI that the AME has been approved.
4. When Monitoring Will Occur
 - a. Prior to the start of any work, the PI shall also submit a construction schedule to MMC through the RE indicating when and where monitoring will occur.
 - b. The PI may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final construction documents which indicate conditions such as age of existing pipe to be replaced, depth of excavation and/or site graded to bedrock, etc., which may reduce or increase the potential for resources to be present.
5. Approval of AME and Construction Schedule

After approval of the AME by MMC, the PI shall submit to MMC written authorization of the AME and Construction Schedule from the CM.

III. During Construction

A. Monitor Shall be Present During Grading/Excavation/Trenching

1. The Archaeological Monitor shall be present full-time during all soil disturbing and grading/excavation/trenching activities which could result in impacts to archaeological resources as identified on the AME. **The Construction Manager is responsible for notifying the RE, PI, and MMC of changes to any construction activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the AME.**
2. The Native American consultant/monitor shall determine the extent of their presence during soil disturbing and grading/excavation/trenching activities based on the AME and provide that information to the PI and MMC. If prehistoric resources are encountered during the Native American consultant/monitor's absence, work shall stop and the Discovery Notification Process detailed in Section III.B-C and IV.A-D shall commence.
3. The PI may submit a detailed letter to MMC during construction requesting a modification to the monitoring program when a field condition such as modern disturbance post-dating the previous grading/trenching activities, presence of fossil formations, or when native soils are encountered that may reduce or increase the potential for resources to be present.
4. The archaeological and Native American consultant/monitor shall document field activity via the Consultant Site Visit Record (CSV). The CSV's shall be faxed by the CM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion**), and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process

1. In the event of a discovery, the Archaeological Monitor shall direct the contractor to temporarily divert all soil disturbing activities, including but not limited to digging, trenching, excavating or grading activities in the area of discovery and in the area reasonably suspected to overlay adjacent resources and immediately notify the RE or BI, as appropriate.
2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.
3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.
4. No soil shall be exported off-site until a determination can be made regarding the significance of the resource specifically if Native American resources are encountered.

C. Determination of Significance

1. The PI and Native American consultant/monitor, where Native American resources are discovered shall evaluate the significance of the resource. If Human Remains are involved, follow protocol in Section IV below.
 - a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required.
 - b. If the resource is significant, the PI shall submit an Archaeological Data Recovery Program (ADRP) and obtain written approval of the program from MMC, CM and RE. ADRP and any mitigation must be approved by MMC, RE and/or CM before ground disturbing activities in the area of discovery will be allowed to resume. **Note: If a**

unique archaeological site is also an historical resource as defined in CEQA Section 15064.5, then the limits on the amount(s) that a project applicant may be required to pay to cover mitigation costs as indicated in CEQA Section 21083.2 shall not apply.

- (1). Note: For pipeline trenching and other linear projects in the public Right-of-Way, the PI shall implement the Discovery Process for Pipeline Trenching projects identified below under “D.”
- c. If the resource is not significant, the PI shall submit a letter to MMC indicating that artifacts will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that that no further work is required.
 - (1). Note: For Pipeline Trenching and other linear projects in the public Right-of-Way, if the deposit is limited in size, both in length and depth; the information value is limited and is not associated with any other resource; and there are no unique features/artifacts associated with the deposit, the discovery should be considered not significant.
 - (2). Note, for Pipeline Trenching and other linear projects in the public Right-of-Way, if significance cannot be determined, the Final Monitoring Report and Site Record (DPR Form 523A/B) shall identify the discovery as Potentially Significant.
- D. Discovery Process for Significant Resources - Pipeline Trenching and other Linear Projects in the Public Right-of-Way
The following procedure constitutes adequate mitigation of a significant discovery encountered during pipeline trenching activities or for other linear project types within the Public Right-of-Way including but not limited to excavation for jacking pits, receiving pits, laterals, and manholes to reduce impacts to below a level of significance:
 1. Procedures for documentation, curation and reporting
 - a. One hundred percent of the artifacts within the trench alignment and width shall be documented in-situ, to include photographic records, plan view of the trench and profiles of side walls, recovered, photographed after cleaning and analyzed and curated. The remainder of the deposit within the limits of excavation (trench walls) shall be left intact.
 - b. The PI shall prepare a Draft Monitoring Report and submit to MMC via the RE as indicated in Section VI-A.
 - c. The PI shall be responsible for recording (on the appropriate State of California Department of Park and Recreation forms-DPR 523 A/B) the resource(s) encountered during the Archaeological Monitoring Program in accordance with the City’s Historical Resources Guidelines. The DPR forms shall be submitted to the South Coastal Information Center for either a Primary Record or SDI Number and included in the Final Monitoring Report.
 - d. The Final Monitoring Report shall include a recommendation for monitoring of any future work in the vicinity of the resource.

IV. Discovery of Human Remains

If human remains are discovered, work shall halt in that area and no soil shall be exported off-site until a determination can be made regarding the provenance of the human remains; and the following procedures as set forth in CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Sec. 7050.5) shall be undertaken:

A. Notification

1. Archaeological Monitor shall notify the RE or BI as appropriate, MMC, and the PI, if the Monitor is not qualified as a PI. MMC will notify the appropriate Senior Planner in the Environmental Analysis Section (EAS) of the Development Services Department to assist with the discovery notification process.
 2. The PI shall notify the Medical Examiner after consultation with the RE, either in person or via telephone.
- B. Isolate discovery site
1. Work shall be directed away from the location of the discovery and any nearby area reasonably suspected to overlay adjacent human remains until a determination can be made by the Medical Examiner in consultation with the PI concerning the provenience of the remains.
 2. The Medical Examiner, in consultation with the PI, will determine the need for a field examination to determine the provenience.
 3. If a field examination is not warranted, the Medical Examiner will determine with input from the PI, if the remains are or are most likely to be of Native American origin.
- C. If Human Remains **ARE** determined to be Native American
1. The Medical Examiner will notify the Native American Heritage Commission (NAHC) within 24 hours. By law, **ONLY** the Medical Examiner can make this call.
 2. NAHC will immediately identify the person or persons determined to be the Most Likely Descendent (MLD) and provide contact information.
 3. The MLD will contact the PI within 24 hours or sooner after the Medical Examiner has completed coordination, to begin the consultation process in accordance with CEQA Section 15064.5(e), the California Public Resources and Health & Safety Codes.
 4. The MLD will have 48 hours to make recommendations to the property owner or representative, for the treatment or disposition with proper dignity, of the human remains and associated grave goods.
 5. Disposition of Native American Human Remains will be determined between the MLD and the PI, and, if:
 - a. The NAHC is unable to identify the MLD, OR the MLD failed to make a recommendation within 48 hours after being notified by the Commission, OR;
 - b. The landowner or authorized representative rejects the recommendation of the MLD and mediation in accordance with PRC 5097.94 (k) by the NAHC fails to provide measures acceptable to the landowner, THEN
 - c. To protect these sites, the landowner shall do one or more of the following:
 - (1) Record the site with the NAHC;
 - (2) Record an open space or conservation easement; or
 - (3) Record a document with the County.
 - d. Upon the discovery of multiple Native American human remains during a ground disturbing land development activity, the landowner may agree that additional conferral with descendants is necessary to consider culturally appropriate treatment of multiple Native American human remains. Culturally appropriate treatment of such a discovery may be ascertained from review of the site utilizing cultural and archaeological standards. Where the parties are unable to agree on the appropriate treatment measures the human remains and items associated and buried with Native American human remains shall be reinterred with appropriate dignity, pursuant to Section 5.c., above.
- D. If Human Remains are **NOT** Native American
1. The PI shall contact the Medical Examiner and notify them of the historic era context of the burial.

2. The Medical Examiner will determine the appropriate course of action with the PI and City staff (PRC 5097.98).
3. If the remains are of historic origin, they shall be appropriately removed and conveyed to the San Diego Museum of Man for analysis. The decision for internment of the human remains shall be made in consultation with MMC, EAS, the applicant/landowner, any known descendant group, and the San Diego Museum of Man.

V. Night and/or Weekend Work

- A. If night and/or weekend work is included in the contract
 1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the precon meeting.
 2. The following procedures shall be followed.
 - a. No Discoveries
In the event that no discoveries were encountered during night and/or weekend work, the PI shall record the information on the CSVR and submit to MMC via fax by 8AM of the next business day.
 - b. Discoveries
All discoveries shall be processed and documented using the existing procedures detailed in Sections III - During Construction, and IV – Discovery of Human Remains. Discovery of human remains shall always be treated as a significant discovery.
 - c. Potentially Significant Discoveries
If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section III - During Construction and IV-Discovery of Human Remains shall be followed.
 - d. The PI shall immediately contact the RE and MMC, or by 8AM of the next business day to report and discuss the findings as indicated in Section III-B, unless other specific arrangements have been made.
- B. If night and/or weekend work becomes necessary during the course of construction
 1. The Construction Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.
 2. The RE, or BI, as appropriate, shall notify MMC immediately.
- C. All other procedures described above shall apply, as appropriate.

VI. Post Construction

- A. Submittal of Draft Monitoring Report
 1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Historical Resources Guidelines (Appendix C/D) which describes the results, analysis, and conclusions of all phases of the Archaeological Monitoring Program (with appropriate graphics) to MMC via the RE for review and approval within 90 days following the completion of monitoring. **It should be noted that if the PI is unable to submit the Draft Monitoring Report within the allotted 90-day timeframe as a result of delays with analysis, special study results or other complex issues, a schedule shall be submitted to MMC establishing agreed due dates and the provision for submittal of monthly status reports until this measure can be met.**
 - a. For significant archaeological resources encountered during monitoring, the Archaeological Data Recovery Program or Pipeline Trenching Discovery Process shall be included in the Draft Monitoring Report.
 - b. Recording Sites with State of California Department of Parks and Recreation
The PI shall be responsible for recording (on the appropriate State of California

Department of Park and Recreation forms-DPR 523 A/B) any significant or potentially significant resources encountered during the Archaeological Monitoring Program in accordance with the City's Historical Resources Guidelines, and submittal of such forms to the South Coastal Information Center with the Final Monitoring Report.

2. MMC shall return the Draft Monitoring Report to the PI via the RE for revision or, for preparation of the Final Report.
 3. The PI shall submit revised Draft Monitoring Report to MMC via the RE for approval.
 4. MMC shall provide written verification to the PI of the approved report.
 5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.
- B. Handling of Artifacts
1. The PI shall be responsible for ensuring that all cultural remains collected are cleaned and catalogued
 2. The PI shall be responsible for ensuring that all artifacts are analyzed to identify function and chronology as they relate to the history of the area; that faunal material is identified as to species; and that specialty studies are completed, as appropriate.
- C. Curation of artifacts: Accession Agreement and Acceptance Verification
1. The PI shall be responsible for ensuring that all artifacts associated with the survey, testing and/or data recovery for this project are permanently curated with an appropriate institution. This shall be completed in consultation with MMC and the Native American representative, as applicable.
 2. When applicable to the situation, the PI shall include written verification from the Native American consultant/monitor indicating that Native American resources were treated in accordance with state law and/or applicable agreements. If the resources were reinterred, verification shall be provided to show what protective measures were taken to ensure no further disturbance occurs in accordance with Section IV – Discovery of Human Remains, Subsection C.
 3. The PI shall submit the Accession Agreement and catalogue record(s) to the RE or BI, as appropriate for donor signature with a copy submitted to MMC.
 4. The RE or BI, as appropriate shall obtain signature on the Accession Agreement and shall return to PI with copy submitted to MMC.
 5. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.
- D. Final Monitoring Report(s)
1. The PI shall submit one copy of the approved Final Monitoring Report to the RE or BI as appropriate, and one copy to MMC (even if negative), within 90 days after notification from MMC of the approved report.
 2. The RE shall, in no case, issue the Notice of Completion until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

I:\AIH\LDREAS\MMRP\Archae Public_101211.doc

PALEONTOLOGICAL RESOURCES

I. Prior to Permit Issuance or Bid Opening/Bid Award

A. Entitlements Plan Check

1. Prior to permit issuance or Bid Opening/Bid Award, whichever is applicable, the Assistant

Deputy Director (ADD) Environmental designee shall verify that the requirements for Paleontological Monitoring have been noted on the appropriate construction documents.

- B. Letters of Qualification have been submitted to ADD
 - 1. Prior to Bid Award, the applicant shall submit a letter of verification to Mitigation Monitoring Coordination (MMC) identifying the Principal Investigator (PI) for the project and the names of all persons involved in the paleontological monitoring program, as defined in the City of San Diego Paleontology Guidelines.
 - 2. MMC will provide a letter to the applicant confirming the qualifications of the PI and all persons involved in the paleontological monitoring of the project.
 - 3. Prior to the start of work, the applicant shall obtain approval from MMC for any personnel changes associated with the monitoring program.

II. Prior to Start of Construction

A. Verification of Records Search

- 1. The PI shall provide verification to MMC that a site specific records search has been completed. Verification includes, but is not limited to a copy of a confirmation letter from San Diego Natural History Museum, other institution or, if the search was in-house, a letter of verification from the PI stating that the search was completed.
- 2. The letter shall introduce any pertinent information concerning expectations and probabilities of discovery during trenching and/or grading activities.

B. PI Shall Attend Precon Meetings

- 1. Prior to beginning any work that requires monitoring, the Applicant shall arrange a Precon Meeting that shall include the PI, Construction Manager (CM) and/or Grading Contractor, Resident Engineer (RE), Building Inspector (BI), if appropriate, and MMC. The qualified paleontologist shall attend any grading/excavation related Precon Meetings to make comments and/or suggestions concerning the Paleontological Monitoring program with the Construction Manager and/or Grading Contractor.
 - a. If the PI is unable to attend the Precon Meeting, the Applicant shall schedule a focused Precon Meeting with MMC, the PI, RE, CM or BI, if appropriate, prior to the start of any work that requires monitoring.
- 2. Acknowledgement of Responsibility for Curation (CIP or Other Public Projects)
The applicant shall submit a letter to MMC acknowledging their responsibility for the cost of curation associated with all phases of the paleontological monitoring program.
- 3. Identify Areas to be Monitored
 - a. Prior to the start of any work that requires monitoring, the PI shall submit a Paleontological Monitoring Exhibit (PME) based on the appropriate construction documents (reduced to 11x17) to MMC for approval identifying the areas to be monitored including the delineation of grading/excavation limits. Monitoring shall begin at depths below 10 feet from existing grade or as determined by the PI in consultation with MMC. The determination shall be based on site specific records search data which supports monitoring at depths less than ten feet.
 - b. The PME shall be based on the results of a site specific records search as well as information regarding existing known soil conditions (native or formation).
 - c. MMC shall notify the PI that the PME has been approved.
- 4. When Monitoring Will Occur
 - a. Prior to the start of any work, the PI shall also submit a construction schedule to MMC through the RE indicating when and where monitoring will occur.

- b. The PI may submit a detailed letter to MMC prior to the start of work or during construction requesting a modification to the monitoring program. This request shall be based on relevant information such as review of final construction documents which indicate conditions such as depth of excavation and/or site graded to bedrock, presence or absence of fossil resources, etc., which may reduce or increase the potential for resources to be present.
5. Approval of PME and Construction Schedule
After approval of the PME by MMC, the PI shall submit to MMC written authorization of the PME and Construction Schedule from the CM.

III. During Construction

A. Monitor Shall be Present During Grading/Excavation/Trenching

1. The monitor shall be present full-time during grading/excavation/trenching activities including, but not limited to mainline, laterals, jacking and receiving pits, services and all other appurtenances associated with underground utilities as identified on the PME that could result in impacts to formations with high and/or moderate resource sensitivity. **The Construction Manager is responsible for notifying the RE, PI, and MMC of changes to any construction activities such as in the case of a potential safety concern within the area being monitored. In certain circumstances OSHA safety requirements may necessitate modification of the PME.**
2. The PI may submit a detailed letter to MMC during construction requesting a modification to the monitoring program when a field condition such as trenching activities that do not encounter formational soils as previously assumed, and/or when unique/unusual fossils are encountered, which may reduce or increase the potential for resources to be present.
3. The monitor shall document field activity via the Consultant Site Visit Record (CSVR). The CSVR's shall be faxed by the CM to the RE the first day of monitoring, the last day of monitoring, monthly (**Notification of Monitoring Completion**), and in the case of ANY discoveries. The RE shall forward copies to MMC.

B. Discovery Notification Process

1. In the event of a discovery, the Paleontological Monitor shall direct the contractor to temporarily divert trenching activities in the area of discovery and immediately notify the RE or BI, as appropriate.
2. The Monitor shall immediately notify the PI (unless Monitor is the PI) of the discovery.
3. The PI shall immediately notify MMC by phone of the discovery, and shall also submit written documentation to MMC within 24 hours by fax or email with photos of the resource in context, if possible.

C. Determination of Significance

1. The PI shall evaluate the significance of the resource.
 - a. The PI shall immediately notify MMC by phone to discuss significance determination and shall also submit a letter to MMC indicating whether additional mitigation is required. The determination of significance for fossil discoveries shall be at the discretion of the PI.
 - b. If the resource is significant, the PI shall submit a Paleontological Recovery Program (PRP) and obtain written approval of the program from MMC, MC and/or RE. PRP and any mitigation must be approved by MMC, RE and/or CM before ground disturbing activities in the area of discovery will be allowed to resume.
 - (1). Note: For pipeline trenching projects only, the PI shall implement the Discovery Process for Pipeline Trenching projects identified below under "D."

- c. If resource is not significant (e.g., small pieces of broken common shell fragments or other scattered common fossils) the PI shall notify the RE, or BI as appropriate, that a non-significant discovery has been made. The Paleontologist shall continue to monitor the area without notification to MMC unless a significant resource is encountered.
 - d. The PI shall submit a letter to MMC indicating that fossil resources will be collected, curated, and documented in the Final Monitoring Report. The letter shall also indicate that no further work is required.
 - (1). Note: For Pipeline Trenching Projects Only. If the fossil discovery is limited in size, both in length and depth; the information value is limited and there are no unique fossil features associated with the discovery area, then the discovery should be considered not significant.
 - (2). Note, for Pipeline Trenching Projects Only: If significance cannot be determined, the Final Monitoring Report and Site Record shall identify the discovery as Potentially Significant.
- D. Discovery Process for Significant Resources - Pipeline Trenching Projects
- The following procedure constitutes adequate mitigation of a significant discovery encountered during pipeline trenching activities including but not limited to excavation for jacking pits, receiving pits, laterals, and manholes to reduce impacts to below a level of significance.
- 1. Procedures for documentation, curation and reporting
 - a. One hundred percent of the fossil resources within the trench alignment and width shall be documented in-situ photographically, drawn in plan view (trench and profiles of side walls), recovered from the trench and photographed after cleaning, then analyzed and curated consistent with Society of Invertebrate Paleontology Standards. The remainder of the deposit within the limits of excavation (trench walls) shall be left intact and so documented.
 - b. The PI shall prepare a Draft Monitoring Report and submit to MMC via the RE as indicated in Section VI-A.
 - c. The PI shall be responsible for recording (on the appropriate forms for the San Diego Natural History Museum) the resource(s) encountered during the Paleontological Monitoring Program in accordance with the City's Paleontological Guidelines. The forms shall be submitted to the San Diego Natural History Museum and included in the Final Monitoring Report.
 - d. The Final Monitoring Report shall include a recommendation for monitoring of any future work in the vicinity of the resource.

IV. Night and/or Weekend Work

- A. If night and/or weekend work is included in the contract
 - 1. When night and/or weekend work is included in the contract package, the extent and timing shall be presented and discussed at the precon meeting.
 - 2. The following procedures shall be followed.
 - a. No Discoveries
In the event that no discoveries were encountered during night and/or weekend work, The PI shall record the information on the CSVr and submit to MMC via the RE via fax by 8AM on the next business day.
 - b. Discoveries
All discoveries shall be processed and documented using the existing procedures detailed in Sections III - During Construction.
 - c. Potentially Significant Discoveries

- If the PI determines that a potentially significant discovery has been made, the procedures detailed under Section III - During Construction shall be followed.
- d. The PI shall immediately contact the RE and MMC, or by 8AM on the next business day to report and discuss the findings as indicated in Section III-B, unless other specific arrangements have been made.
- B. If night and/or weekend work becomes necessary during the course of construction
 1. The Construction Manager shall notify the RE, or BI, as appropriate, a minimum of 24 hours before the work is to begin.
 2. The RE, or BI, as appropriate, shall notify MMC immediately.
 - C. All other procedures described above shall apply, as appropriate.

V. Post Construction

- A. Preparation and Submittal of Draft Monitoring Report
 1. The PI shall submit two copies of the Draft Monitoring Report (even if negative), prepared in accordance with the Paleontological Guidelines which describes the results, analysis, and conclusions of all phases of the Paleontological Monitoring Program (with appropriate graphics) to MMC via the RE for review and approval within 90 days following the completion of monitoring,
 - a. For significant paleontological resources encountered during monitoring, the Paleontological Recovery Program or Pipeline Trenching Discovery Process shall be included in the Draft Monitoring Report.
 - b. Recording Sites with the San Diego Natural History Museum
The PI shall be responsible for recording (on the appropriate forms) any significant or potentially significant fossil resources encountered during the Paleontological Monitoring Program in accordance with the City's Paleontological Guidelines, and submittal of such forms to the San Diego Natural History Museum with the Final Monitoring Report.
 2. MMC shall return the Draft Monitoring Report to the PI via the RE for revision or, for preparation of the Final Report.
 3. The PI shall submit revised Draft Monitoring Report to MMC via the RE for approval.
 4. MMC shall provide written verification to the PI of the approved report.
 5. MMC shall notify the RE or BI, as appropriate, of receipt of all Draft Monitoring Report submittals and approvals.
- B. Handling of Fossil Remains
 1. The PI shall be responsible for ensuring that all fossil remains collected are cleaned and catalogued.
- C. Curation of artifacts: Deed of Gift and Acceptance Verification
 1. The PI shall be responsible for ensuring that all fossil remains associated with the monitoring for this project are permanently curated with an appropriate institution.
 2. The PI shall submit the Deed of Gift and catalogue record(s) to the RE or BI, as appropriate for donor signature with a copy submitted to MMC.
 3. The RE or BI, as appropriate shall obtain signature on the Deed of Gift and shall return to PI with copy submitted to MMC.
 4. The PI shall include the Acceptance Verification from the curation institution in the Final Monitoring Report submitted to the RE or BI and MMC.
- D. Final Monitoring Report(s)
 1. The PI shall submit two copies of the Final Monitoring Report to MMC (even if negative), within 90 days after notification from MMC of the approved report.

2. The RE shall, in no case, issue the Notice of Completion until receiving a copy of the approved Final Monitoring Report from MMC which includes the Acceptance Verification from the curation institution.

I:\AI\LDR\EAS\MMRP\Paleo Public_021910.doc

VI. PUBLIC REVIEW DISTRIBUTION:

Draft copies or notice of this Mitigated Negative Declaration were distributed to:

US Government
US Fish & Wildlife Service

State of California
California Dept. of Fish & Wildlife

County of San Diego
Dept. of Environmental Health

City of La Mesa

City of San Diego
Councilmember Sherman - District 7
Councilmember Emerald – District 9
Mayor’s Office
City Attorney’s Office
Shannon Thomas
Facilities Financing
Tom Tomlinson
Water Review
Mehdi Rastakhiz
Development Services
Mark Brunette
Peter Kann
Engineering and Capital Projects
Alice Altes
James Arnhart
Library Dept. – Government Projects
San Carlos Branch Library
College – Rolando Branch Library

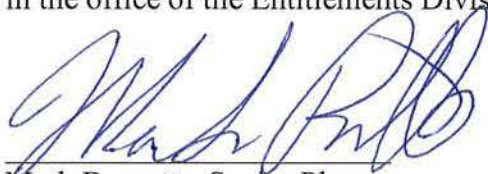
Other Groups and Individuals
Navajo Community Planners Inc.
San Carlos Area Council
San Diego Natural History Museum
Historical Resources Board
South Coastal Information Center
San Diego History Center

San Diego Archaeological Center
Save Our Heritage Organisation
San Diego County Archaeological Society, Inc.
Ron Christman
Clint Linton
Frank Brown – Inter-Tribal Cultural Resources Council
Campo Band of Mission Indians
Native American Heritage Commission
Kumeyaay Cultural Heritage Preservation
Kumeyaay Cultural Repatriation Committee
Native American Distribution
Sierra Club
San Diego Audubon Society
Mr. Jim Peugh
California Native Plant Society
Endangered Habitats League

VII. RESULTS OF PUBLIC REVIEW:

- () No comments were received during the public input period.
- (X) Comments were received but did not address the draft Mitigated Negative Declaration finding or the accuracy/completeness of the Initial Study. No response is necessary. The letters are attached.
- () Comments addressing the findings of the draft Negative Declaration and/or accuracy or completeness of the Initial Study were received during the public input period. The letters and responses follow.

Copies of the draft Mitigated Negative Declaration, and any Initial Study material are available in the office of the Entitlements Division for review, or for purchase at the cost of reproduction.



Mark Brunette, Senior Planner
Development Services Department

November 6, 2015

Date of Draft Report

December 10, 2015

Date of Final Report

Analyst: Mark Brunette

Attachments: Figures 1 & 2
 Location Map
 Initial Study Checklist

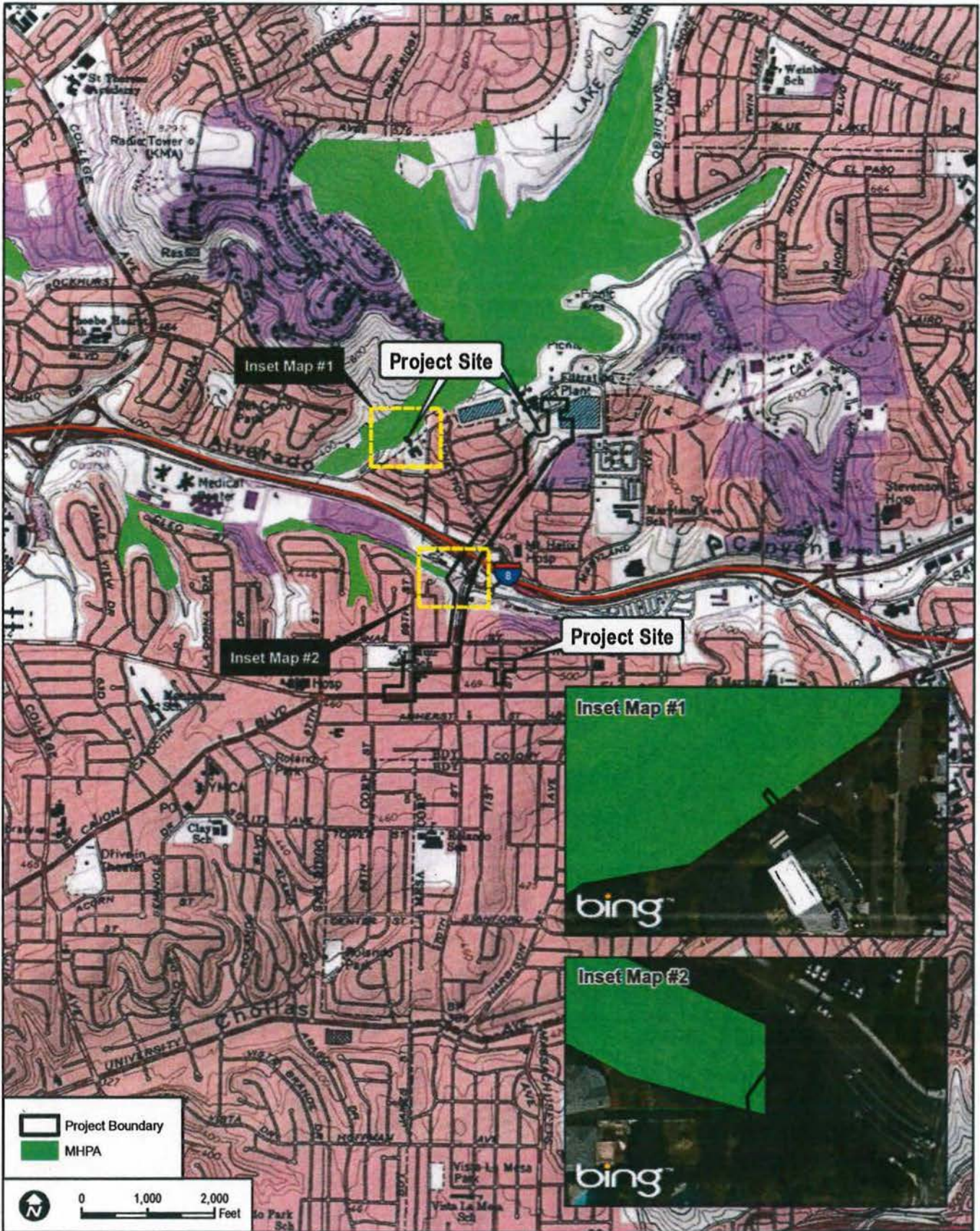


DUDEK

7643-06

FIGURE 1
Regional Map

MID-CITY PIPELINE PHASE II - BIOLOGICAL RESOURCES LETTER REPORT



DUDEK

7643-06

SOURCE: USGS 7.5-Minute Series La Mesa Quadrangle; SANGIS 2003

MID-CITY PIPELINE PHASE II - BIOLOGICAL RESOURCES LETTER REPORT

FIGURE 2
Vicinity Map

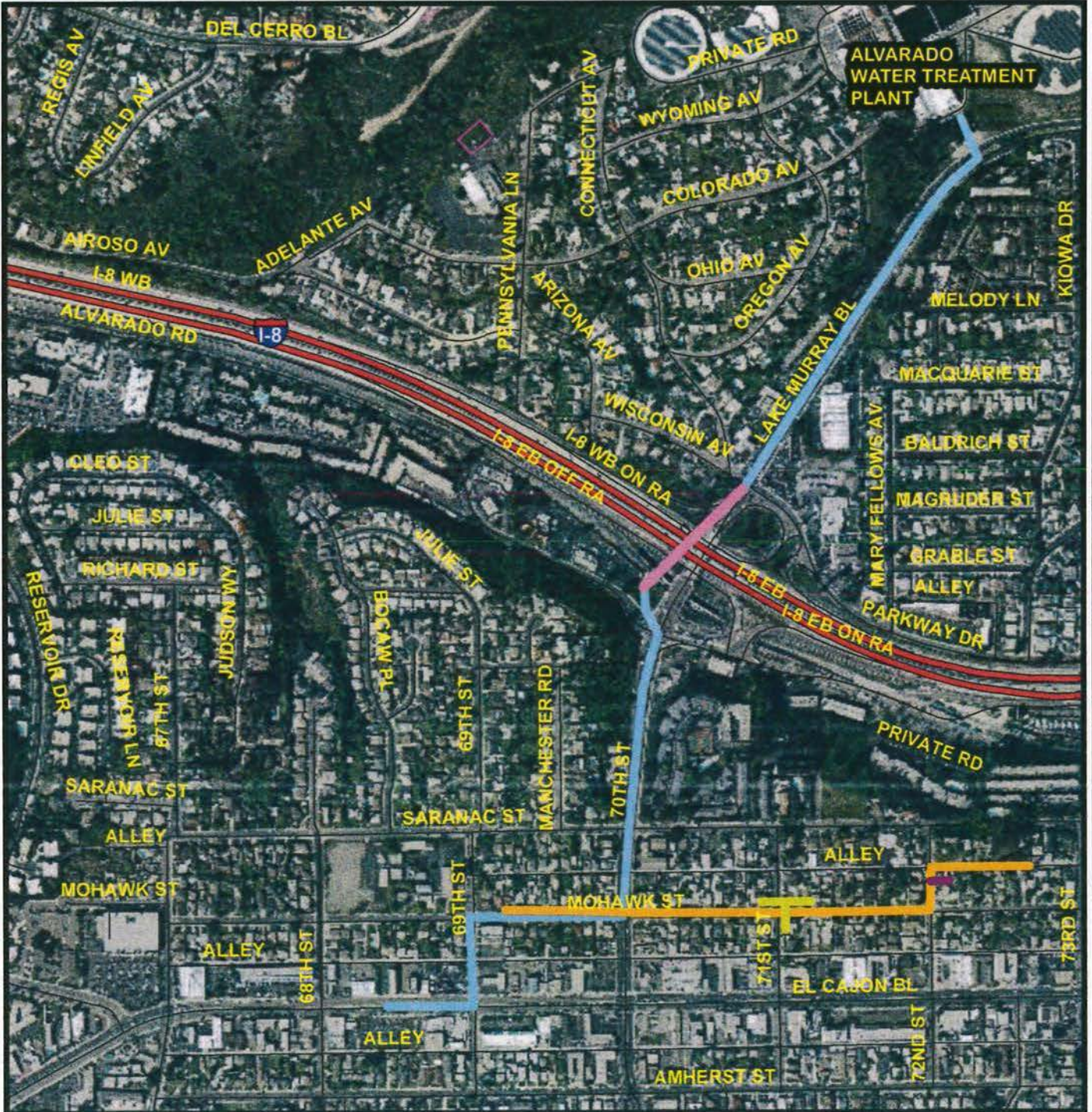
MID-CITY PIPELINE PROJECT - PHASE II

SENIOR ENGINEER
 IRAJ ASGHARZADEH, P.E.
 619-533-5104

PROJECT MANAGER
 ALICE ALTES, P.E.
 619-533-4105

PROJECT ENGINEER
 MICHELLE GARCIA-QUILICO
 619-533-6635

CONSTRUCTION PROJECT
 INFORMATION LINE
 619-533-4207



Legend

- Service Transfer
- 8 inch Main
- Tunnel Crossing
- Mid-City Pipeline Phase 2
- Abandonment



COMMUNITY NAME: COLLEGE AREA-NAVAJO

COUNCIL DISTRICT: 7 & 9

SAP ID: S11026

MGQuilico / Nov. 12, 2014



THIS MAP/DATA IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Note: This product may contain information reproduced with permission granted by RAND MCNALLY & COMPANY © to SanGIS. This map is copyrighted by RAND MCNALLY & COMPANY.

INITIAL STUDY CHECKLIST

1. Project Title/Project Number:

MONTEZUMA PIPELINE/MID-CITY PIPELINE PHASE 2

2. Lead agency name and address:

City of San Diego
Department of Development Services
1222 First Avenue, MS 501
San Diego, CA 92101

3. Contact person and phone number:

Mark Brunette/ (619) 446-5379

4. Project location:

The Project is located in eastern and mid-city San Diego (Figure 1) along Lake Murray Boulevard/70th Street and neighboring side streets in portions of the College Area and Navajo communities (Figure 2). Portions of the Project along Lake Murray Boulevard at Interstate 8 (I-8) lie within the municipal boundaries of the City of La Mesa. The Project's southern terminus is at El Cajon Boulevard and 68th Street in the City of San Diego, California; the northern terminus is within the grounds of the Alvarado Water Treatment Plant along Lake Murray Boulevard (Figure 2).

5. Project Applicant/Sponsor's name and address:

City of San Diego Public Works Department – Engineering and Capital Projects, Architectural Engineering & Parks Division, 600 B Street / MS 908, San Diego, CA 92101-4502

6. General Plan designation:

City of San Diego Public Right-of-Way (PROW) land is not a designated land use in the General Plan. However, right-of-way is categorized as Road/Freeways/ Transportation in the General Plan. The Pacific Beach Reservoir site is designated Residential in the General Plan and Single Family Residential in the Pacific Beach Community Plan.

7. Zoning:

The project would take place within various public rights-of-way and public easements within developed areas of the Pacific Beach, Mission Bay Park, Midway-Pacific Highway, Peninsula and Linda Vista Community Planning Areas in the City of San Diego. Adjacent zoning may include, but is not limited to, Open Space, Residential, Commercial, Institutional, and Industrial. The Pacific Beach Reservoir property is within the RS-1-4 (Single Family Residential) zone.

8. Description of project (Describe the whole action involved, including but not limited to, later phases of the project, and any secondary, support, or off-site features necessary for its implementation.):

The Montezuma/Mid-City Pipeline Phase II project is the second and final phase, of a larger project that provides a parallel and redundant water pipeline to the City of San Diego's existing 54" Trojan Water Transmission Pipeline. The Montezuma/Mid-City Pipeline is needed to enhance water service and reliability for the Mid-City areas, which include the communities of City Heights, College Area, Darnall, El Cerrito, Kensington, North Park, Normal Heights, Oak Park, Redwood Village, Rolando, Talmadge, and University Heights. The first phase of the project was completed in 2002 and is currently in service. Phase 1 included 4.5 miles of 48" diameter cement mortar lined and coated (CML&C) steel water transmission main, which generally runs along El Cajon Boulevard starting on Highland Drive and ending at the San Diego County Water Authority (SDCWA)/City of San Diego Flow Control Facility (FCF) 18/21. FCF 18/21 is located between 68th Street and 69th Street on El Cajon Boulevard.

A SITE DEVELOPMENT PERMIT for encroachment into Environmentally Sensitive Lands is required for Phase II of the project. Phase II would install approximately 1.16 miles of new water pipelines, consisting of 5,680 linear feet (LF) of new 66" diameter Cement Lined and Coated Steel transmission main and 422 LF of 8-inch PVC distribution main. The 66-inch transmission main will run from the Alvarado Water Treatment Plant (AWTP), located at the intersection of Lake Murray Boulevard and Kiowa Drive, to the intersection of 68th and El Cajon Boulevard. The northern terminus of the pipeline will be connected to Existing Valve Vault No. 3 located where the Earl Thomas Reservoir Outlet Pipeline intersects the Clear Wells Interconnect Pipeline at the AWTP. The south terminus will be connected to the Mid-City Pipeline Phase 1 project water lines which start on El Cajon Boulevard between 68th and 69th Streets. The project also includes replacement of a remote control panel and 34-foot tall antenna mast for the Murray 2nd Pipeline, as well as installation of insert flow meters for the Murray 2nd Pipeline and the Mid-City Pipeline.

The majority of the project alignment will be constructed using open trenching. The pipeline will be tunneled and no trenching will be required at three locations: 1) crossing Interstate 8; 2) under the San Diego County Water Authority 108-inch main on Lake Murray Boulevard; and 3) under the San Diego County Water Authority 48-inch main on El Cajon Boulevard. For the I-8 crossing, the tunnel launching pit will be located in the Denny's parking lot at 6970 Alvarado Road on the south side of I-8, and the receiving pit will be on the north side of I-8 in the City of La Mesa within the Lake Murray Boulevard public right-of-way. Both tunneling pits will be sited in existing development areas that do not contain sensitive biological resources.

There will be excavations in unpaved areas at the connection with Valve Vault No. 3 at the AWTP and at the Murray 2nd Pipeline. Existing Valve Vault No. 3 is on City owned land adjacent to Lake Murray Boulevard. The excavation for the Murray 2nd Pipeline is partially within a Multiple Habitat Preservation Area. It is on City owned property near the Del Cerro Baptist Church at the intersection of Pennsylvania Lane and Delaware Avenue. Related work will include traffic control, best management practices for erosion control and storm drain inlet

protection, ADA curb ramp installation, pipe abandonment, and resurfacing and restoration of disturbed areas to their original condition. Existing below grade water line will be abandoned along portions of Mohawk Street, 72nd Street, and a public alley north of Mohawk Street.

Equipment and pipeline staging areas would be located within existing roadway paved areas and parking lots adjacent to the roadways. An office trailer is expected to be used by the construction contractor. The trailer is expected to be located on City property at the Earl Thomas Reservoir near the Alvarado Water Treatment Plant.

Surrounding land uses and setting: Briefly describe the project's surroundings:

Elevations in the study area range from 472 feet above mean sea level (AMSL) near the southern extent of the Project to 513 AMSL near the northern terminus of the Project at the Alvarado Water Treatment Plant (AWTP). Surrounding land uses are best described as developed with mixed use development supported by single- and multi-family residential uses, commercial, and communication utilities for the AWTP. South of I-8, the topography increases in elevation as the Project heads south into the College Area, where single-family neighborhoods lie on a flat plateau overlooking I-8. The Project area also supports a school, multi-family residential uses, and commercial developments along 68th Street to El Cajon Boulevard.

10. Other public agencies whose approval is required (e.g., permits, financing approval, or participation agreement.):
 1. City of La Mesa Encroachment Permit for any work in La Mesa right-of-way or public easements.
 2. City of La Mesa Encroachment Agreement for any type of private improvements encroaching into the public right-of-way or public easement.
 3. Dept. of Occupational Safety and Health (DOSH) for construction of trenches or excavation which are five feet or deeper and into which a person is required to descend.
 4. Transportation permits for unusually wide and heavy loads.
 5. Caltrans discretionary review and approval, and an Encroachment Permit for any work in Caltrans right-of-way or public easements.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

- | | | |
|---|--|---|
| <input type="checkbox"/> Aesthetics | <input type="checkbox"/> Greenhouse Gas Emissions | <input type="checkbox"/> Population/Housing |
| <input type="checkbox"/> Agriculture and Forestry Resources | <input type="checkbox"/> Hazards & Hazardous Materials | <input type="checkbox"/> Public Services |
| <input type="checkbox"/> Air Quality | <input type="checkbox"/> Hydrology/Water Quality | <input type="checkbox"/> Recreation |
| <input checked="" type="checkbox"/> Biological Resources | <input checked="" type="checkbox"/> Land Use/Planning | <input type="checkbox"/> Transportation/Traffic |
| <input checked="" type="checkbox"/> Cultural Resources | <input type="checkbox"/> Mineral Resources | <input type="checkbox"/> Utilities/Service System |
| <input type="checkbox"/> Geology/Soils | <input type="checkbox"/> Noise | <input checked="" type="checkbox"/> Mandatory Findings Significance |

DETERMINATION: (To be completed by Lead Agency)

On the basis of this initial evaluation:

- The proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- Although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
- The proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
- The proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect (a) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and (b) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required.

- Although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or (MITIGATED) NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or (MITIGATED) NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

EVALUATION OF ENVIRONMENTAL IMPACTS:

- 1) A brief explanation is required for all answers except “No Impact” answers that are adequately supported by the information sources a lead agency cites in the parentheses following each question. A “No Impact” answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A “No Impact” answer should be explained where it is based on project specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis.)
- 2) All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.
- 3) Once the lead agency has determined that a particular physical impact may occur, the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. “Potentially Significant Impact” is appropriate if there is substantial evidence that an effect may be significant. If there are one or more “Potentially Significant Impact” entries when the determination is made, an EIR is required.
- 4) “Negative Declaration: Less Than Significant With Mitigation Incorporated” applies where the incorporation of mitigation measures has reduced an effect from “Potentially Significant Impact” to a “Less Than Significant Impact.” The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from “Earlier Analyses”, as described in (5) below, may be cross-referenced).
- 5) Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or (mitigated) negative declaration. *Section 15063(c)(3)(D)*. In this case, a brief discussion should identify the following:
 - a. Earlier Analysis Used. Identify and state where they are available for review.

- b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.
 - c. Mitigation Measures. For effects that are “Less Than Significant With Mitigation Measures Incorporated”, describe the mitigation measures that were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.
- 6) Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.
- 7) Supporting Information Sources: A source list should be attached, and other sources used or individuals contacted should be cited in the discussion. Please note, all reports and documents mentioned in this document are available for public review in the Entitlements Division on the Fifth Floor of 1222 First Avenue, San Diego.
- 8) This is only a suggested form, and lead agencies are free to use different formats; however, lead agencies should normally address the questions from this checklist that are relevant to a project’s environmental effects in whatever format is selected.
- 9) The explanation of each issue should identify:
- a. The significance criteria or threshold, if any, used to evaluate each question; and
 - b. The mitigation measure identified, if any, to reduce the impact to less than significant.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

I) AESTHETICS – Would the project:

- a) Have a substantial adverse effect on a scenic vista?

All of the proposed work would occur either below grade or under existing bridges where existing pipeline would be replaced or repaired so no new visual impacts occur as a result of the project. In addition, it is not anticipated that the project would remove or replace trees or street lights. Therefore, the proposed project would have no significant impacts to public scenic vistas and no mitigation would be required.

- b) Substantially damage scenic resources, including but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

See answer to I.a. above. In addition, the project would not damage any existing scenic trees, rock outcroppings, or historic buildings (Refer to V.a.) as none of these features are located within the boundaries of the proposed project.

- c) Substantially degrade the existing visual character or quality of the site and its surroundings?

See answer to I.b. above.

- d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

The project does not include any new or modified light sources such as new or replacement street lights, and the project would not utilize highly reflective materials. In addition, no substantial sources of light would be generated during project construction, as construction activities would occur during daylight hours. The project would also be subject to the City's Outdoor Lighting Regulations per Municipal Code Section 142.0740.

II) AGRICULTURAL AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. – Would the project:

- a) Converts Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

The project would occur within existing improved PROW or sewer or water easements which are not designated for agricultural use or farmland. In addition, agricultural land is not present in the vicinity of the project.

- b) Conflict with existing zoning for agricultural use, or a Williamson Act Contract?

Refer to II.a.

- c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 1220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?

The project would occur in an urbanized area of San Diego within existing improved PROW or sewer or water easements which are not designated as forest land. In addition, forest land land is not present in the vicinity of the project.

- d) Result in the loss of forest land or conversion of forest land to non-forest use?

Refer to II.c.

- e) Involve other changes in the existing environment, which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use?

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

The project does not propose a change in land use and would not result in the conversion of Farmland since no Farmland exists within, or in the vicinity, of the project boundaries.

III. AIR QUALITY – Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied on to make the following determinations - Would the project:

- a) Conflict with or obstruct implementation of the applicable air quality plan?

The proposed sewer and water main replacement would not involve any future actions that would generate air quality emissions as a result of the proposed use (e.g. vehicle miles traveled). However, emissions would occur during the construction phase of the project and could increase the amount of harmful pollutants entering the air basin. The emissions would be minimal and would only occur temporarily during construction. Additionally, the construction equipment typically involved in water/sewer project is small-scale and generates relatively few emissions. When appropriate, dust suppression methods would be included as project components. As such, the project would not conflict with the region’s air quality plan.

- b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Refer to III.b

- c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

As described above, construction operations could temporarily increase the emissions of dust and other pollutants. However, construction emissions would be temporary and implementation of Best Management Practices would reduce potential impacts related to construction activities to below a level of significance. Therefore, the project would not result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under applicable federal or state ambient air quality standards.

- d) Expose sensitive receptors to substantial

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

pollutant concentrations?

Construction operations could temporarily increase the emissions of harmful pollutants, which could affect sensitive receptors adjacent to the project. However, construction emissions would be temporary and it is anticipated that implementation of construction BMPs would reduce potential impacts related to construction activities to minimal levels. Therefore, the project would not expose sensitive receptors to substantial pollutant concentrations.

- e) Create objectionable odors affecting a substantial number of people?

Operation of construction equipment and vehicles could generate odors associated with fuel combustion. However, these odors would dissipate into the atmosphere upon release and would only remain temporarily in proximity to the construction equipment and vehicles. Therefore, the project would not create odors affecting a substantial number of people

IV. BIOLOGICAL RESOURCES – Would the project:

- a) Have substantial adverse effects, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

A Biological Letter Report for the Pacific Beach Pipeline Project was prepared by Tierra Data Inc. (August 22, 2014). The letter report analyzed the impacts of the proposed project on the biological resources located in the vicinity of the Pacific Beach Reservoir and the North Ingraham, South Ingraham and West Mission Bay Drive bridges. The remainder of the pipeline project occurs within improved public right-of-way and previously disturbed sewer and water easements which do not contain sensitive biological resources. The Biological Letter Report concluded the project would not result in significant, direct, indirect, or cumulative impacts to sensitive or regulated biological resources at the three affected bridges or reservoir site, and no mitigation is necessary for the project beyond standard Best Management Practices.

- b) Have a substantial adverse effect on any riparian habitat or other community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

Refer to IV.a.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IV.a. According to the project’s biological letter report the project would not result in any impacts to wetlands or waters of the US near the site due to the use of standard Best Management Practices during project construction.

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

According to the project’s biological letter report, Mission Bay is not a designated as a wildlife corridor and it does not restrict the movement of animals between habitats. The reservoir site is an isolated patch of habitat in an urbanized area that does not act as a wildlife corridor. As such, the project does not occur in designated wildlife corridors and, therefore, will not substantially interfere with wildlife movement.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IV.a. The project would comply with all local policies and ordinances protecting biological resources including satisfying mitigation requirements for impacts to sensitive biological resources in accordance with the City of San Diego Multiple Species Conservation Program and the City of San Diego Biology Guidelines. Furthermore, the site is not in or adjacent to an MHPA nor does it contain trees subject to a tree preservation policy.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IV.a and IV.e. The site is not within or adjacent to an MHPA. The project would not conflict with any local conservation plans.

V. CULTURAL RESOURCES – Would the project:

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Cause a substantial adverse change in the | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

significance of an historical resource as defined in §15064.5?

The only potential historical resource that could be affected by the project is the abandoned Pacific Beach Reservoir. However, a Historical Resource Technical Report for the Pacific Beach Pipeline Project (Rincon Consultants, January 6, 2014) recommended that, based on the results of a records search, archival research, and a site visit, the Pacific Beach Reservoir is ineligible for listing in the California Historical Register of Historical Resources (CRHR). The Historical Report was reviewed by qualified City of San Diego Historic Review staff who concurred with the report's recommendation.

- b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

The Pacific Beach Pipeline Project may include excavation of previously undisturbed native surficial soil, which has the potential to contain sensitive archaeological resources. Therefore, the project could result in a significant environmental impact on archaeological resources.

To reduce potential impacts to archaeological resources to below a level of significance, excavation within previously undisturbed soil, for either new trench alignments and/or for replacement of pipelines within the same trench alignment occurring at a deeper depth than the previously existing pipeline, would be monitored by a qualified archaeologist or archaeological monitor. Any significant archaeological resources that are encountered would be recovered and curated in accordance with the mitigation monitoring and Reporting Program (MMRP) detailed in Section V.

- c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

The portion of the Pacific Beach Pipeline project that is north of the North Ingraham Street bridge could involve excavation depths greater than 10 feet in the Linda Vista Formation (moderate sensitivity rating for discovery of paleontological resources), and the Bay Point and San Diego formations (high sensitivity rating). Therefore, the project could result in potentially significant impacts to fossil resources.

To reduce potential impacts on paleontological resources to below a level of significance, excavation within previously undisturbed formations at a depth of 10 or more feet, for either new trench alignments and/or for replacement of pipelines within the same trench alignment occurring at a deeper depth than the previously existing

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

pipeline, would be monitored by a qualified paleontologist or paleontological monitor. Any significant paleontological resources encountered would be recovered and curated in accordance with the mitigation monitoring and Reporting Program (MMRP) detailed in Section V.

- d) Disturb any human remains, including those interred outside of formal cemeteries?

No cemeteries, formal or informal, have been identified on or adjacent to the project site. While there is a possibility of encountering human remains during subsequent project construction activities, if remains are found monitoring would be required. In addition, per CEQA Section 15064.5(e), the California Public Resources Code (Sec. 5097.98) and State Health and Safety Code (Sec. 7050.5), if human remains are discovered during construction, work would be required to halt in that area and no soil would be exported off-site until a determination could be made regarding the provenance of the human remains via the County Coroner and other authorities as required.

VI. GEOLOGY AND SOILS – Would the project:

- a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
- i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

The project would utilize proper engineering design and standard construction practices in order to ensure that potential impacts in this category based on regional geologic hazards would remain less than significant. Therefore risks from rupture of a known earthquake fault would be below a level of significance.

- ii) Strong seismic ground shaking?

See VI.a.i above. The project would be required to utilize proper engineering design and standard construction practices to ensure that the potential for impacts from ground shaking would be below a level of significance.

- iii) Seismic-related ground failure, including liquefaction?

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

See VI.a and b above.

- | | | | | |
|-----------------|--------------------------|--------------------------|-------------------------------------|--------------------------|
| iv) Landslides? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|-----------------|--------------------------|--------------------------|-------------------------------------|--------------------------|

See VI.a and b above.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Result in substantial soil erosion or the loss of topsoil? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to VI.a. In addition, the majority of the project would occur within the improved public right of way. Any disturbances to paved alleys and streets would be backfilled and resurfaced in kind. Excavation of the abandoned Pacific Beach Reservoir would be backfilled, graded and the entire site would be revegetated, which would preclude soil erosion or topsoil loss. Additionally, appropriate Best Management Practices would be utilized during project construction to prevent soil erosion. As such, the project would not result in a substantial amount of soil erosion or loss of topsoil.

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

The project is located within various Geologic Hazard Categories. However, proper engineering design and utilization of standard construction practices would ensure that the potential impacts would be less than significant.

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

Refer to VI.a.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to VI.a. In addition, no septic or alternative wastewater systems are proposed since the scope of the project is to repair and replace existing public sewer and water mains.

VII. GREENHOUSE GAS EMISSIONS – Would the project:

- | | | | | |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|
| a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|---|--------------------------|--------------------------|-------------------------------------|--------------------------|

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

The City is utilizing data from the California Air Pollution Control Officers Association (CAPCOA) report "CEQA & Climate Change" dated January 2008 as an interim significance threshold to determine whether there is a potential for significant Greenhouse Gas (GHG) impacts and a GHG analysis will be required. The CAPCOA report references a 900 metric ton guideline as a conservative threshold for requiring further analysis and possible mitigation. This emission level is based on the amount of vehicle trips, the typical energy and water use associated with projects, and other factors.

CAPCOA identifies project types that are estimated to emit approximately 900 metric tons of GHG's annually. This 900 metric ton threshold is roughly equivalent to 35000 square feet of office space, 11,000 square feet of retail, 50 single family residential units, 70 multi-family residential units and 6,300 square-foot supermarkets.

Since the proposed sewer and water main repair project does not fit in the categories listed above, a GHG modeling analysis was conducted to determine the level of GHG emissions. The Roadway Construction Emission Model is a spreadsheet program created by the Sacramento Metropolitan Air Quality Management District to analyze construction related GHGs and was utilized to quantify the project's GHG emissions. The model utilizes project information (e.g. total construction months, project type, construction equipment, grading quantities and the total disturbance area, etc.) to quantify GHG emissions from heavy-duty construction equipment, haul trucks and worker commute trips associated with linear construction projects.

Results of the Roadway Construction Emissions Model output demonstrated that during the 14 months of construction the project would generated approximately 600 metric tons per year. The output for the project falls well below the 900 metric ton per year figure. Therefore, based on the aforementioned GHG analysis, the project would result in a less than significant CEQA Greenhouse Gas impact and mitigation would not be required.

- b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

The project as proposed would not conflict with any applicable plan, policy, or regulation adopted for the purpose of reducing greenhouse gas emission in that it would be constructed in an established urban area with services and facilities available. In addition, the project is consistent with the General Plan.

VIII. HAZARDS AND HAZARDOUS MATERIALS –

- Would the project:
- a) Create a significant hazard to the public or the

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

environment through routine transport, use, or disposal of hazardous materials?

Construction of the project may require the use of hazardous materials (e.g. fuels, lubricants, solvents, etc.) which would require proper storage, handling, use and disposal; however, these conditions would not occur during routine construction within the PROW. Construction specifications would include requirements for the contractor regarding where routine handling or disposal of hazardous materials could occur and what measures to implement in the event of a spill from equipment. Compliance with contract specifications would ensure that potential hazards are minimized to below a level of significance.

- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Construction of the project may have the potential to traverse properties which could contain Leaking Underground Storage Tank (LUST) cleanup sites, permitted UST's, or contaminated sites located within 1,000 feet of the project alignments; however, in the event that construction activities encounter underground contamination, the contractor would be required to implement section 803 of the City's "WHITEBOOK" for "Encountering or Releasing Hazardous Substances or Petroleum Products" of the City of San Diego Standard Specifications for Public Works Construction which is included in all construction documents and would ensure the proper handling and disposal of any contaminated soils in accordance with all applicable local, state, and federal regulations. Compliance with these requirements would minimize the risk to the public and the environment; therefore, impacts would remain less than significant.

- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Portions of the project alignment are within one-quarter mile of existing schools and would involve trenching or excavation activities that could result in the release of hazardous emissions if unanticipated contamination is encountered within the PROW. However, section 803 of the City's "WHITEBOOK" to ensure that appropriate protocols are followed pursuant to County DEH requirements should any hazardous conditions be encountered. As such, impacts regarding the handling or discovery of hazardous materials, substances or waste within close proximity of a school would be below a level of significance with implementation of the measures required pursuant to the contract specifications and County DEH oversight.

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

See VIIIa-c above. In addition, the project alignment and Pacific Beach Reservoir Site are not included on a list of hazardous materials locations.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two mile of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Portions of the project alignment are within the Airport Influence Area of the San Diego International Airport Land Use Compatibility Plan. However, since the proposed project involves linear underground sewer and water main repair, it would not introduce any new features that would result in a safety hazard for people residing or working in the area, or create a flight hazard.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project site is not within proximity of a private airstrip.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Construction of the proposed project would temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan would be implemented during construction which would allow emergency plans to be employed. Therefore, the project would not physically interfere with and adopted emergency response plan or emergency evacuation plan.

- | | | | | |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|
| h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands? | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
|--|--------------------------|--------------------------|-------------------------------------|--------------------------|

The proposed project would be located within the City's Public Right-of-Way or sewer and water easements, and the Pacific Beach Reservoir site, which are not located within

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

or adjacent to wildlands that could pose a threat of wildland fires. Additionally, sewer and water infrastructure projects do not introduce any new features that would increase the risk of fire.

IX. HYDROLOGY AND WATER QUALITY - Would the project:

- a) Violate any water quality standards or waste discharge requirements?

Potential impacts to existing water quality standards associated with the proposed project would include minimal short-term construction-related erosion sedimentation, but would not include any long term operational storm water impacts. The project would be required to comply with the City’s Storm Water Standards Manual and would have to comply with either a Water Pollution Control Plan or Storm Water Pollution Prevention Plan. These plans would prevent or effectively minimize short-term water quality impacts during construction activities. Therefore, the proposed project would not violate any existing water quality standards or discharge requirements.

- b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

The project does not use groundwater, nor would it create new impervious surfaces that would interfere with groundwater recharge.

- c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner, which would result in substantial erosion or siltation on- or off-site?

All areas that are trenched would be backfilled and resurfaced to their pre-construction condition, including resurfacing trenches within existing improved public rights-of-way. The Pacific Beach Reservoir site will be backfilled, graded and re-vegetated in accordance with an approved City Grading Permit and City grading standards. Thus, the project would not substantially alter drainage patterns.

- d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?

Refer to IX.c.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| e) Create or contribute runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IX.c. The project would be required to comply with all local and regional storm water quality standards during construction using approved Best Management Practices (BMPs), which would ensure that water quality is not degraded.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| f) Otherwise substantially degrade water quality? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

Refer to IX.c. The project would be required to comply with all local and regional storm water quality standards during construction using approved Best Management Practices (BMPs), which would ensure that water quality is not degraded.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project does not propose any housing.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| h) Place within a 100-year flood hazard area, structures that would impede or redirect flood flows? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project does not propose any structures that would impede flood flows as it is a linear underground utility project.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

The proposed project does not include any features that would increase the risk associated with flooding beyond those of existing conditions.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| j) Inundation by seiche, tsunami, or mudflow? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

The proposed project does not include any features that would increase the risk

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

associated with inundation by seiche, tsunami, or mudflow beyond those of existing conditions.

X. LAND USE AND PLANNING – Would the project:

- a) Physically divide an established community?

The project would involve replacing and installing utility infrastructure underground and would not introduce new features that could divide an established community.

- b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The project would involve replacing and installing utility infrastructure underground and would be consistent with all applicable land use plans, policies, or regulations of an agency with jurisdiction over the project and would not conflict with any land use plans.

- c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Refer to IV. The project is not within or adjacent to the preserve areas of the City of San Diego Multiple Species Conservation Program and would therefore not conflict with any applicable habitat conservation plans.

- d) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

The areas around the proposed project alignment and the abandoned reservoir property are not being used for the recovery of mineral resources and are not designed by the General Plan or other local, state or federal land use plan for mineral resources recovery; therefore, the project would not result in the loss of mineral resources.

- e) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Refer to X.e

XII. NOISE – Would the project result in:

- a) Generation of noise levels in excess of standards established in the local general plan or noise

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

ordinance, or applicable standards of other agencies?

The project would not result in any the generation of operational noise levels in excess of existing standards or existing ambient noise levels in the vicinity of the project.

- b) Generation of excessive ground borne vibration or ground borne noise levels?

The project would not result in any the generation of operational ground borne vibration or noise levels in excess of existing standards or ambient levels.

- c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Refer to XII.a-b

- d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above existing without the project?

The proposed linear underground sewer and water repair project would result in construction noise, but would be temporary in nature; in addition, the project is required to comply with the San Diego Municipal Code, Chapter 5, Article 9.5, (§59.5.0404 Construction Noise). This section specifies that it is unlawful for any person, between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on legal holidays (with exception of Columbus Day and Washington’s Birthday), or on Sundays, to erect, construct, demolish, excavate for, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. In addition, the project would be required to conduct any construction activity so as to not cause, at or beyond the property lines of any property zoned residential, an average sound level greater than 75 decibels during the 12-hour period from 7:00 a.m. to 7:00 p.m.

- e) For a project located within an airport land use plan, or, where such a plan has not been adopted, within two miles of a public airport or public use airport would the project expose people residing or working in the area to excessive noise levels?

Portions of the project alignment are within the Airport Influence Area of the San Diego International Airport Land Use Compatibility Plan and most areas have higher ambient noise levels due to the fact that they are located within heavily traveled roadways. The project in and of itself would not generate operational noise. Compliance with OSHA

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

standards will ensure the project workers would not be exposed to excessive noise levels.

- | | | | | |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|
| f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|--|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project site is not located within the vicinity of a private airstrip.

XIII. POPULATION AND HOUSING – Would the project:

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

The project scope does not include the construction of new or extended roads or infrastructure, or new homes and businesses. The project would replace and rehabilitate existing outdated sewer and water infrastructure. Therefore, the project would not induce population growth nor require the construction of new infrastructure.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

No such displacement would result. There is no existing housing within the boundaries of the proposed project.

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|

No such displacement would result. There is no existing housing or residents within the boundaries of the project.

XIV. PUBLIC SERVICES

- | | | | | |
|---|--------------------------|--------------------------|--------------------------|-------------------------------------|
| a) Would the project result in substantial adverse physical impacts associated with the provisions of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service rations, response times or other performance objectives for any of the public services: | | | | |
| i) Fire Protection | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> |

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

The project would not result in adverse physical impacts of fire facilities or adversely affect existing levels of fire services.

ii) Police Protection

The project would not affect existing levels of police protection service and would not require the construction or expansion of a police facility.

iii) Schools

The project would not affect existing levels of public services and would not require the construction or expansion of a school facility.

v) Parks

The project would not affect existing levels of public services and would not require the construction or expansion of a park facility.

vi) Other public facilities

The project would not affect existing levels of public services; therefore, no new or altered government facilities would be required.

XV. RECREATION -

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The project would not adversely affect the availability of and/or need for new or expanded recreational resources.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

Refer to XV.a. The project does not propose recreation facilities nor require the construction or expansion of any such facilities.

XVI. TRANSPORTATION/TRAFFIC – Would the project?

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

- a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?
-

Construction of the proposed project would temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan would be implemented during construction such that traffic circulation would not be substantially impacted. Therefore, the project would not result in any significant permanent increase in traffic generation.

- b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?
-

Construction of the proposed project would temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan would be implemented during construction so that existing cumulative or individual levels of service are minimally impacted. Therefore, the project would not result in any significant permanent increase in traffic generation or permanent reduction in level of service.

- c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?
-

Refer to XVI.c. In addition, the project would not result in safety risks or a change to air traffic patterns in that all work would occur underground or beneath existing bridge structures.

- d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?
-

The project would not create a permanent increase in hazards resulting from design features and would reduce temporary hazards due to construction to a less than

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

significant level through a Traffic Control Plan. The project does not propose any change in land use that would affect existing land uses in the area.

- e) Result in inadequate emergency access?

Construction of the proposed project would temporarily affect traffic circulation within the project Area of Potential Effect (APE) and its adjoining roads. However, an approved Traffic Control Plan would be implemented during construction such that emergency access would not be substantially impacted. Therefore, the project would not result in inadequate emergency access.

- f) Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?

The project would temporarily impact circulation during construction activities relative to traffic, pedestrians, public transit and bicycles. However, the preparation of a Traffic Control Plan would ensure that any disruption to these services would not be significant.

XVII. UTILITIES AND SERVICE SYSTEMS – Would the project:

- a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Construction of the proposed project would facilitate the treatment of wastewater and would not exceed the requirements of the Regional Quality Control Board.

- b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Construction of the proposed project would result in improvements to water and sewer pipeline infrastructure and would not result in a significant unmitigated impact on the environment.

- c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Construction of the proposed project would occur primarily within the PROW and

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

would not create new impervious surfaces. Therefore, the project would not require the construction of new storm water drainage facilities or expansion of existing facilities.

- d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Construction of the proposed project would not increase the demand for water and would improve the existing water pipelines within the project area.

- e) Result in a determination by the wastewater treatment provided which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?
Refer to XVII.c

- f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Construction of the project would result in the removal of the abandoned Pacific Beach Reservoir structure, but otherwise would likely generate minimal waste. Project waste would be disposed of in accordance with all applicable local and state regulations pertaining to solid waste including the permitted capacity of the landfill serving the project area. Demolition or construction materials which can be recycled shall comply with the City's Construction and Demolition Debris Ordinance. Operation of the project would not generate waste and, therefore, would not affect the permitted capacity of the landfill serving the project area.

- g) Comply with federal, state, and local statutes and regulation related to solid waste?

Refer to XVII.f. Any solid waste generated during construction related activities would be recycled or disposed of in accordance with all applicable local, state and federal regulations.

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE -

- a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or

Issue	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
-------	--------------------------------	--	------------------------------	-----------

prehistory?

The proposed project would not impact any Sensitive Biological Resources and the project would not be located within or adjacent to the Multi Habitat Planning Area (MHPA) of the MSCP. With respect to cultural resources, mitigation for archaeology and paleontology has been incorporated into the MND. Please see Section V of the MND for further details on all mitigation requirements. As a result, project implementation would not result in a significant impact to these resources.

- b) Does the project have impacts that are individually limited, but cumulatively considerable? (“Cumulatively considerable” means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable futures projects)?
-

When viewed in terms of the overall impacts of Citywide linear pipeline repair projects, any potential incremental impacts to cultural resources from this project would be mitigated to below a level of significance. Collectively, all Citywide project impacts on cultural resources are reduced to a less than significant level through project mitigation. Please see Section V of the MND for further details on all mitigation requirements. As a result, project implementation would not result in any individually limited, but cumulatively significant impacts to these resources.

- c) Does the project have environmental effects, which will cause substantial adverse effects on human beings, either directly or indirectly?
-

As stated previously, potentially significant impacts have been identified for archaeological and paleontological resources. However, mitigation has been included in Section V of this MND to reduce impacts to below a level of significance. As such, project implementation would not result in substantial adverse impact on human beings.

INITIAL STUDY CHECKLIST

REFERENCES

I. AESTHETICS / NEIGHBORHOOD CHARACTER

- City of San Diego General Plan; City of San Diego Land Development Municipal Code
- Community Plan.
- Local Coastal Plan.

II. AGRICULTURAL RESOURCES & FOREST RESOURCES

- City of San Diego General Plan.
- U.S. Department of Agriculture, Soil Survey - San Diego Area, California, Part I and II, 1973.
- California Agricultural Land Evaluation and Site Assessment Model (1997)
- Site Specific Report:

III. AIR QUALITY

- California Clean Air Act Guidelines (Indirect Source Control Programs) 1990.
- Regional Air Quality Strategies (RAQS) - APCD.
- Site Specific Report:

IV. BIOLOGY

- City of San Diego, Multiple Species Conservation Program (MSCP), Subarea Plan, 1997
- City of San Diego, MSCP, "Vegetation Communities with Sensitive Species and Vernal Pools" Maps, 1996.
- City of San Diego, MSCP, "Multiple Habitat Planning Area" maps, 1997.
- Community Plan - Resource Element.
- California Department of Fish and Game, California Natural Diversity Database, "State and Federally-listed Endangered, Threatened, and Rare Plants of California," January 2001.

- California Department of Fish & Game, California Natural Diversity Database, "State and Federally-listed Endangered and Threatened Animals of California," January 2001.
- City of San Diego Land Development Code Biology Guidelines.
- Site Specific Report: Biology Letter Report for the Pacific Beach Pipeline Project by Tierra Data Inc, dated August 22, 2014.

V. CULTURAL RESOURCES (INCLUDES HISTORICAL RESOURCES)

- City of San Diego Historical Resources Guidelines.
- City of San Diego Archaeology Library.
- Historical Resources Board List.
- Community Historical Survey:
- Site Specific Reports: Pacific Beach Pipeline Project Historical Resource Technical Report by Rincon Consultants, dated January 6, 2014

VI. GEOLOGY/SOILS

- City of San Diego Seismic Safety Study.
- U.S. Department of Agriculture Soil Survey - San Diego Area, California, Part I and II, December 1973 and Part III, 1975.
- Site Specific Report(s):

VII. GREENHOUSE GAS EMISSIONS

- Site Specific Report: Roadway Construction Emissions Models conducted for the proposed project.

VIII. HAZARDS AND HAZARDOUS MATERIALS

- San Diego County Hazardous Materials Environmental Assessment Listing,
- San Diego County Hazardous Materials Management Division
- FAA Determination
- State Assessment and Mitigation, Unauthorized Release Listing, Public Use Authorized.
- Airport Land Use Compatibility Plan.
- Site Specific Report:

IX. HYDROLOGY/WATER QUALITY

- Flood Insurance Rate Map (FIRM).
- Federal Emergency Management Agency (FEMA), National Flood Insurance Program - Flood Boundary and Floodway Map.
- Clean Water Act Section 303(b) list, http://www.swrcb.ca.gov/tmdl/303d_lists.html.
- Site Specific Reports: Revegetation Plan For The Pacific Beach Reservoir Site by Tierra Data Inc., dated August 2014.

X. LAND USE AND PLANNING

- City of San Diego General Plan.
- Community Plan.
- Airport Land Use Compatibility Plan
- City of San Diego Zoning Maps
- FAA Determination

XI. MINERAL RESOURCES

- California Department of Conservation - Division of Mines and Geology, Mineral Land Classification.
- Division of Mines and Geology, Special Report 153 - Significant Resources Maps.
- Site Specific Report:

XII. NOISE

- Community Plan
- San Diego International Airport - Lindbergh Field CNEL Maps.
- Brown Field Airport Master Plan CNEL Maps.
- Montgomery Field CNEL Maps.
- San Diego Association of Governments - San Diego Regional Average Weekday Traffic Volumes.
- San Diego Metropolitan Area Average Weekday Traffic Volume Maps, SANDAG.
- City of San Diego General Plan.
- Site Specific Report:

XIII. PALEONTOLOGICAL RESOURCES

- City of San Diego Paleontological Guidelines.
- Deméré, Thomas A., and Stephen L. Walsh, "Paleontological Resources City of San Diego," Department of Paleontology San Diego Natural History Museum, 1996.
- Kennedy, Michael P., and Gary L. Peterson, "Geology of the San Diego Metropolitan Area, California. Del Mar, La Jolla, Point Loma, La Mesa, Poway, and SW 1/4 Escondido 7 1/2 Minute Quadrangles," California Division of Mines and Geology Bulletin 200, Sacramento, 1975.
- Kennedy, Michael P., and Siang S. Tan, "Geology of National City, Imperial Beach and Otay Mesa Quadrangles, Southern San Diego Metropolitan Area, California," Map Sheet 29, 1977.
- Site Specific Report:

XIV. POPULATION / HOUSING

- City of San Diego General Plan.
- Community Plan.
- Series 11 Population Forecasts, SANDAG.
- Other:

XV. PUBLIC SERVICES

- City of San Diego General Plan.
- Community Plan.

XVI. RECREATIONAL RESOURCES

- City of San Diego General Plan.
- Community Plan.
- Department of Park and Recreation
- City of San Diego - San Diego Regional Bicycling Map

___ Additional Resources:

XVII. TRANSPORTATION / CIRCULATION

X City of San Diego General Plan.

X Community Plan.

___ San Diego Metropolitan Area Average Weekday Traffic Volume Maps, SANDAG.

___ San Diego Region Weekday Traffic Volumes, SANDAG.

___ Site Specific Report:

XVIII. UTILITIES

X City of San Diego General Plan.

X Community Plan.

XIX. WATER CONSERVATION

X City of San Diego General Plan.

X Community Plan.

___ Sunset Magazine, New Western Garden Book. Rev. ed. Menlo Park, CA: Sunset Magazine.



Edmund G. Brown Jr.
Governor

STATE OF CALIFORNIA
Governor's Office of Planning and Research
State Clearinghouse and Planning Unit



Ken Alex
Director

December 8, 2015

Mark Brunette
City of San Diego
1222 First Avenue, MS-501
San Diego, CA 92101

Subject: Montezuma Pipeline/Mid-City Pipeline Phase 2 SDP (PTS No. 406277)
SCH#: 2015111024

Dear Mark Brunette:

The State Clearinghouse submitted the above named Mitigated Negative Declaration to selected state agencies for review. The review period closed on December 7, 2015, and no state agencies submitted comments by that date. This letter acknowledges that you have complied with the State Clearinghouse review requirements for draft environmental documents, pursuant to the California Environmental Quality Act.

Please call the State Clearinghouse at (916) 445-0613 if you have any questions regarding the environmental review process. If you have a question about the above-named project, please refer to the ten-digit State Clearinghouse number when contacting this office.

Sincerely,

Scott Morgan
Director, State Clearinghouse

1400 TENTH STREET P.O. BOX 3044 SACRAMENTO, CALIFORNIA 95812-3044
TEL (916) 445-0613 FAX (916) 323-3018 www.opr.ca.gov

**Document Details Report
State Clearinghouse Data Base**

SCH# 2015111024
Project Title Montezuma Pipeline/Mid-City Pipeline Phase 2 SDP (PTS No. 406277)
Lead Agency San Diego, City of

Type MND Mitigated Negative Declaration

Description A Site Development Permit for the installation of approx. 1.16 miles of new water pipelines which consists of 5,680 linear feet of new 66" diameter Cement Lined and Coated Steel transmission main and 422 LF of 8-inch PVC distribution main. The 66-inch transmission main will run from the Alvarado Water Treatment Plant (AWTP), located at the intersections of Lake Murray Blvd. and Kiowa Dr., to the intersection of 68th and El Cajon Blvd. The northern terminus of the pipeline will be connected to Existing Valve Vault No. 3 located where the Earl Thomas Reservoir Outlet Pipeline intersects the Clear Wells Interconnect Pipeline at the AWTP. The south terminus will be connected to the Mid-City Pipeline Phase 1 project water lines which start on El Cajon Blvd. between 68th and 69th Streets. The project also includes replacement of a remote control panel and antenna mast for the Murray 2nd Pipeline, as well as installation of insert flow meters for the Murray 2nd Pipeline and the Mid-City Pipeline. The majority of the project alignment will be constructed using open trenching. The pipeline will be tunneled and no trenching will be required at three locations: 1) crossing I-8; 2) under the San Diego County Water Authority 108-inch main on Lake Murray Blvd.; and 3) under the San Diego Water Authority 48-inch main on El Cajon Blvd. For the I-8 crossing, the tunnel launching pit will be located in the Denny's parking lot at 6970 Alvarado Road on the south side of I-8, and the receiving pit will be on the north side of I-8 in the City of La Mesa within the Lake Murray Blvd. public right of way. Both tunneling pits will be sited in existing development areas that do not contain sensitive biological resources.

There will be excavations in unpaved areas at the connection with Valve Vault No. 3 at the AWTP and at the Murray 2nd Pipeline. Existing Valve Vault No. 3 is on the City owned land adjacent to Lake Murray Blvd. The excavation for the Murray 2nd Pipeline is partially within a Multiple Habitat Preservation Area. It is on City owned property near the Del Cero Baptist Church at the intersection of Pennsylvania Lane and Delaware Ave. Related work will include traffic control, best management practices for erosion control and storm drain inlet protection, ADA curb ramp installation, pipe abandonment, and resurfacing and restoration of disturbed areas to their original condition. Existing below grade water line will be abandoned along portions of Mohawk Street, 72nd Street, and a public alley north of Mohawk Street.

Note: Blanks in data fields result from insufficient information provided by lead agency

**Document Details Report
State Clearinghouse Data Base**

Lead Agency Contact

Name Mark Brunette
Agency City of San Diego
Phone 619-446-5379 **Fax**
email
Address 1222 First Avenue, MS-501

City San Diego **State** CA **Zip** 92101

Project Location

County San Diego
City La Mesa, San Diego
Region
Lat / Long 32° 46' 07" N / 117° 02' 50" W
Cross Streets Several including Lake Murray Blvd. and El Cajon Blvd.
Parcel No. 463-010-40, 464-010-07
Township **Range** **Section** **Base**

Proximity to:

Highways 94,8
Airports
Railways MTS
Waterways Lake Murray
Schools SDSU, Crawford, Helix HS
Land Use Public Right of Way, RS-1-2 (Residential - Single Family), AR-1-1 (Agricultural - Residential)

Project Issues Archaeologic-Historic; Biological Resources; Toxic/Hazardous; Landuse

Reviewing Agencies Resources Agency; Department of Fish and Wildlife, Region 5; Department of Parks and Recreation; Department of Water Resources; California Highway Patrol; Caltrans, District 11; Air Resources Board; State Water Resources Control Board, Division of Drinking Water; State Water Resources Control Board, Division of Financial Assistance; Regional Water Quality Control Board, Region 9; Native American Heritage Commission; Public Utilities Commission; State Lands Commission

Date Received 11/06/2015 **Start of Review** 11/06/2015 **End of Review** 12/07/2015

Note: Blanks in data fields result from insufficient information provided by lead agency

DEPARTMENT OF TRANSPORTATION

DISTRICT 11, DIVISION OF PLANNING

4050 TAYLOR ST, M.S. 240

SAN DIEGO, CA 92110

PHONE (619) 688-6960

FAX (619) 688-4299

TTY 711

www.dot.ca.gov



*Serious drought.
Help save water!*

November 19, 2015

11-SD-8

PM 21.81

SCH#2015111024

Montezuma/Mid City Pipelines MND

Mr. Mark Brunette
City of San Diego
1222 1st Ave, M.S. 501
San Diego, CA 92101

Dear Mr. Brunette:

The California Department of Transportation (Caltrans) has received the Mitigated Negative Declaration (MND) dated November 6, 2015, for the Montezuma/Mid City Pipeline Project located at Lake Murray and Interstate 8 (I-8). Caltrans has the following comments:

Any work performed within Caltrans right-of-way (R/W) will require discretionary review and approval by Caltrans and an encroachment permit will be required for any work within the Caltrans R/W prior to construction. As part of the encroachment permit process, the applicant must provide an approved final environmental document including the California Environmental Quality Act (CEQA) determination addressing any environmental impacts within the Caltrans' R/W, and any corresponding technical studies. If these materials are not included with the encroachment permit application, the applicant will be required to acquire and provide these to Caltrans before the permit application will be accepted. Identification of avoidance and/or mitigation measures will be a condition of the encroachment permit approval as well as procurement of any necessary regulatory and resource agency permits. Encroachment permit submittals that are incomplete can result in significant delays in permit approval.

Additional information regarding encroachment permits may be obtained by contacting the Caltrans Permits Office at (619) 688-6158. Early coordination with Caltrans is strongly advised for all encroachment permits.

If you have any questions, please contact Roy Abboud at (619) 688-6968.

Sincerely,

JACOB M. ARMSTRONG, Branch Chief
Development Review Branch

*"Provide a safe, sustainable, integrated and efficient transportation system
to enhance California's economy and livability"*

VIEJAS

TRIBAL GOVERNMENT

PQ Box 908
Alpine, CA 91903
#1 Viejas Grade Road
Alpine, CA 91901

Phone: 6194453810
Fax: 6194455337
viejas.com

November 16, 2015

Mark Brunette
1222 First Avenue, MS 501
San Diego, CA 92101

RE: Montezuma Pipeline/Mid-City Pipeline Phase 2, Project No. 406277

Dear Mr. Brunette,

The Viejas Band of Kumeyaay Indians ("Viejas") has reviewed the proposed project and at this time we have determined that the project site is has cultural significance or ties to Viejas. Viejas Band request that a Kumeyaay Cultural Monitor be on site for ground disturbing activities to inform us of any new developments such as inadvertent discovery of cultural artifacts, cremation sites, or human remains. Please call Julie Hagen for scheduling at 619-659-2339 or email jhagen@viejas-nsn.gov. Thank you

Sincerely,

VIEJAS BAND OF KUMEYAAY INDIANS



San Diego County Archaeological Society, Inc.

Environmental Review Committee

5 December 2015

To: Mr. Mark Brunette
Development Services Department
City of San Diego
1222 First Avenue, Mail Station 501
San Diego, California 92101

Subject: Draft Mitigated Negative Declaration
Montezuma Pipeline/Mid-City Pipeline Phase 2
Project No. 406277


Dear Mr. Brunette:

I have reviewed the subject on behalf of this committee of the San Diego County Archaeological Society.

Based on the information contained in the DMND and the letter report from Helix Environmental Planning, we agree with the mitigation program prescribed for cultural resources.

SDCAS appreciates the opportunity to participate in the environmental review process for this project.

Sincerely,


James W. Royle, Jr., Chairperson
Environmental Review Committee

cc: Helix Environmental Planning
SDCAS President
File

RINCON BAND OF LUISEÑO INDIANS

Culture Committee

1 W. Tribal Road · Valley Center, California 92082 ·
(760) 297-2621 or (760) 297-2622 & Fax: (760) 749-8901



November 16, 2015

Mark Brunette
The City of San Diego
Development Services Department
1222 First Avenue, MS 501
San Diego, CA 92101

Re: Montezuma Pipeline/Mid-City Pipeline Phase 2

Dear Mr. Burnette:

This letter is written on behalf of the Rincon Band of Luiseño Indians. Thank you for inviting us to submit comments on the Montezuma Pipeline/Mid-City Pipeline Phase 2 Project. Rincon is submitting these comments concerning your projects potential impact on Luiseño cultural resources.

The Rincon Band has concerns for the impacts to historic and cultural resources and the finding of items of significant cultural value that could be disturbed or destroyed and are considered culturally significant to the Luiseño people. This is to inform you, your identified location is not within the Luiseño Aboriginal Territory. We recommend that you locate a tribe within the project area to receive direction on how to handle any inadvertent findings according to their customs and traditions.

If you would like information on tribes within your project area, please contact the Native American Heritage Commission and they will assist with a referral.

Thank you for the opportunity to protect and preserve our cultural assets.

Sincerely,



Vincent Whipple
Manager
Rincon Cultural Resources Department

Bo Mazzetti
Tribal Chairman

Stephanie Spencer
Vice Chairwoman

Steve Stallings
Council Member

Laurie E. Gonzalez
Council Member

Alfonso Kolb
Council Member

**PALA TRIBAL HISTORIC
PRESERVATION OFFICE**

PMB 50, 35008 Pala Temecula Road
Pala, CA 92059
760-891-3510 Office | 760-742-3189 Fax



December 21, 2015

Mark Brunette
City of San Diego, Planning Dept.
1222 First Ave, MS 413
San Diego, CA 92101

Re: Montezuma Pipeline/ Mid- City Pipeline Phase 2- Project No. 406277

Dear Mr. Brunette:

The Pala Band of Mission Indians Tribal Historic Preservation Office has received your notification of the project referenced above. This letter constitutes our response on behalf of Robert Smith, Tribal Chairman.

We have consulted our maps and determined that the project as described is not within the boundaries of the recognized Pala Indian Reservation. The project is also beyond the boundaries of the territory that the tribe considers its Traditional Use Area (TUA). Therefore, we have no objection to the continuation of project activities as currently planned and we defer to the wishes of Tribes in closer proximity to the project area.

We appreciate involvement with your initiative and look forward to working with you on future efforts. If you have questions or need additional information, please do not hesitate to contact me by telephone at 760-891-3515 or by e-mail at sgaughen@palatribe.com.

Sincerely,

Shasta C. Gaughen, PhD
Tribal Historic Preservation Officer
Pala Band of Mission Indians

ATTENTION: THE PALA TRIBAL HISTORIC PRESERVATION OFFICE IS RESPONSIBLE FOR ALL REQUESTS FOR CONSULTATION. PLEASE ADDRESS CORRESPONDENCE TO SHASTA C. GAUGHEN AT THE ABOVE ADDRESS. IT IS NOT NECESSARY TO ALSO SEND NOTICES TO PALA TRIBAL CHAIRMAN ROBERT SMITH.

NOTICE OF DETERMINATION

TO: X Recorder/County Clerk
P.O. Box 1750, MS A33
1600 Pacific Hwy, Room 260
San Diego, CA 92101-2422

FROM: City of San Diego
Development Services Department
1222 First Avenue, MS 501
San Diego, CA 92101

F I L E D
Ernest J Dronenburg, Jr. Recorder County Clerk

MAY 05 2017

BY *Kathy H. Bass*
DEPUTY

170067

Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

PROJECT NUMBER: 406277/S-11026.02.06

STATE CLEARINGHOUSE NUMBER: 2015111024

PROJECT TITLE: MONTEZUMA PIPELINE/MID-CITY PIPELINE PHASE 2

PROJECT LOCATION: The Project is located in eastern and mid-city San Diego along Lake Murray Boulevard/70th Street and neighboring side streets in portions of the College Area and Navajo communities. Portions of the Project along Lake Murray Boulevard at Interstate 8 (I-8) lie within the municipal boundaries of the City of La Mesa. The Project's southern terminus is at El Cajon Boulevard and 68th Street in the City of San Diego, California; the northern terminus is within the grounds of the Alvarado Water Treatment Plant along Lake Murray Boulevard. The project is located within the Navajo, College Area, and Mid-City: Eastern Area Community Plan areas and Council Districts 7 and 9.

PROJECT DESCRIPTION: A SITE DEVELOPMENT PERMIT for the installation of approximately 1.16 miles of new water pipelines which consists of 5,680 linear feet (LF) of new 66" diameter Cement Lined and Coated Steel transmission main and 422 LF of 8-inch PVC distribution main. The 66-inch transmission main will run from the Alvarado Water Treatment Plant (AWTP), located at the intersection of Lake Murray Boulevard and Kiowa Drive, to the intersection of 68th and El Cajon Boulevard. The northern terminus of the pipeline will be connected to Existing Valve Vault No. 3 located where the Earl Thomas Reservoir Outlet Pipeline intersects the Clear Wells Interconnect Pipeline at the AWTP. The south terminus will be connected to the Mid-City Pipeline Phase 1 project water lines which start on El Cajon Boulevard between 68th and 69th Streets. The project also includes replacement of a remote control panel and antenna mast for the Murray 2nd Pipeline, as well as installation of insert flow meters for the Murray 2nd Pipeline and the Mid-City Pipeline. The majority of the project alignment will be constructed using open trenching. The pipeline will be tunneled and no trenching will be required at three locations: 1) crossing Interstate 8; 2) under the San Diego County Water Authority 108-inch main on Lake Murray Boulevard; and 3) under the San Diego County Water Authority 48-inch main on El Cajon Boulevard. For the I-8 crossing, the tunnel launching pit will be located in the Denny's parking lot at 6970 Alvarado Road on the south side of I-8, and the receiving pit will be on the north side of I-8 in the City of La Mesa within the Lake Murray Boulevard public right-of-way. Both tunneling pits will be sited in existing development areas that do not contain sensitive biological resources.

There will be excavations in unpaved areas at the connection with Valve Vault No. 3 at the AWTP and at the Murray 2nd Pipeline. Existing Valve Vault No. 3 is on City owned land adjacent to Lake Murray Boulevard. The excavation for the Murray 2nd Pipeline is partially within a Multiple Habitat Preservation Area. It is on City owned property near the Del Cerro Baptist Church at the intersection of Pennsylvania Lane and Delaware Avenue. Related work will include traffic control, best management practices for erosion control and storm drain inlet protection, ADA curb ramp installation, pipe abandonment, and resurfacing and restoration of disturbed areas to their original condition. Existing below grade water line will be abandoned along portions of Mohawk Street, 72nd Street, and a public alley north of Mohawk Street.

PROJECT APPLICANT: City of San Diego Public Works Department, 525 B Street, Suite 750, MS 908A San Diego, CA 92101. Contact: Alice Altes, (619) 533-4105.

This is to advise that, on March 7, 2016 the Development Services Department approved the above described project and made the following determinations:

- 1. The project in its approved form ___ will, X will not, have a significant effect on the environment.

2. An Environmental Impact Report was prepared for this project and certified pursuant to the provisions of CEQA.
- A Mitigated Negative Declaration was prepared for this project pursuant to the provisions of CEQA.
- An Addendum to Negative Declaration / Mitigated Negative Declaration / Environmental Impact Report No. _____ was prepared for this project pursuant to the provisions of CEQA.

Record of project approval may be examined at the address above.

3. Mitigation measures were, were not, made a condition of the approval of the project; and a mitigation, monitoring and reporting program was, was not, adopted for the project.
4. (EIR only) Findings were, were not, made pursuant to CEQA Guidelines Section 15091.
5. (EIR only) A Statement of Overriding Considerations was, was not, adopted for this project.

It is hereby certified that the final environmental report, including comments and responses, is available to the general public at the office of the Development Services Department, 1222 First Avenue, San Diego, CA 92101.

Analyst: Mark Brunette

Telephone: (619) 446-5379

Filed by: *Mark Brunette*
Signature

Senior Planner
Title

FILED IN THE OFFICE OF THE COUNTY CLERK

San Diego County on MAY 05 2017

Posted MAY 05 2017 Removed JUN 05 2017

Returned to agency on JUN 05 2017

Deputy *Paul J. Bar*



State of California - Department of Fish and Wildlife

2017 ENVIRONMENTAL FILING FEE CASH RECEIPT

DFW 753.5a (Rev. 12/15/15) Previously DFG 753.5a

RECEIPT NUMBER: 37-2017- 0372
STATE CLEARINGHOUSE NUMBER (If applicable) 2015111024

SEE INSTRUCTIONS ON REVERSE. TYPE OR PRINT CLEARLY.

LEAD AGENCY CITY OF SAN DIEGO	LEAD AGENCY EMAIL --	DATE 05/05/17
COUNTY/STATE AGENCY OF FILING San Diego County		DOCUMENT NUMBER *20170067*
PROJECT TITLE MONTEZUMA PIPELINE/MID-CITY PIPELINE PHASE 2		

PROJECT APPLICANT NAME CITY OF SAN DIEGO PUBLIC WORKS DEPARTMENT	PROJECT APPLICANT EMAIL --	PHONE NUMBER 619.533.4105
PROJECT APPLICANT ADDRESS 525 B STREET SUITE 750 MS 908A	CITY SAN DIEGO	STATE CA
		ZIP CODE 92101

PROJECT APPLICANT (Check appropriate box)

- Local Public Agency
 School District
 Other Special District
 State Agency
 Private Entity

CHECK APPLICABLE FEES:

- | | | | |
|--|------------|----|------------------|
| <input type="checkbox"/> Environmental Impact Report (EIR) | \$3,078.25 | \$ | _____ |
| <input checked="" type="checkbox"/> Mitigated/Negative Declaration (MND)(ND) | \$2,216.25 | \$ | _____ \$2,216.25 |
| <input type="checkbox"/> Certified Regulatory Program document (CRP) | \$1,046.50 | \$ | _____ |

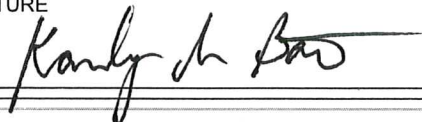
170067

- Exempt from fee
 Notice of Exemption (attach)
 CDFW No Effect Determination (attach)
 Fee previously paid (attach previously issued cash receipt copy)

- | | | | |
|---|----------|----|---------------|
| <input type="checkbox"/> Water Right Application or Petition Fee (State Water Resources Control Board only) | \$850.00 | \$ | _____ |
| <input checked="" type="checkbox"/> County documentary handling fee | | \$ | _____ \$50.00 |
| <input type="checkbox"/> Other | | \$ | _____ |

PAYMENT METHOD:

- Cash
 Credit
 Check
 Other 0001570894
 TOTAL RECEIVED
 \$ _____ \$2,266.25

SIGNATURE X 	AGENCY OF FILING PRINTED NAME AND TITLE San Diego County KANDY MAE BAO , Deputy
--	--



ORIGINAL - PROJECT APPLICANT

COPY - CDFW/ASB

COPY - LEAD AGENCY

COPY - COUNTY CLERK

DFW 753.5a (Rev. 20151215)



Ernest J. Dronenburg, Jr.

COUNTY OF SAN DIEGO

ASSESSOR/RECORDER/COUNTY CLERK



ASSESSOR'S OFFICE

1600 Pacific Highway, Suite 103
 San Diego, CA 92101-2480
 Tel. (619) 236-3771 * Fax (619) 557-4056

www.sdarcc.com

RECORDER/COUNTY CLERK'S OFFICE

1600 Pacific Highway, Suite 260
 P.O. Box 121750 * San Diego, CA 92112-1750
 Tel. (619)237-0502 * Fax (619)557-4155

Transaction #: 383977220170505

Deputy: KBAO

Location: COUNTY ADMINISTRATION BUILDING

05-May-2017 09:50

FEES:

2,216.25	Qty of 1 Fish & Game Neg Dec (1800) for Ref# 20170067
50.00	Qty of 1 Fish and Game Filing Fee for Ref# 20170372
<hr/>	
2,266.25	TOTAL DUE

PAYMENTS:

2,266.25	Check
<hr/>	
2,266.25	TENDERED

SERVICES AVAILABLE AT OFFICE LOCATIONS

- * Tax Bill Address Changes
- * Records and Certified Copies:
 Birth/ Marriage/ Death/ Real Estate
- * Fictitious Business Names (DBAs)
- * Marriage Licenses and Ceremonies
- * Assessor Parcel Maps

SERVICES AVAILABLE ON-LINE AT www.sdarcc.com

- * Forms and Applications
- * Frequently Asked Questions (FAQs)
- * Grantor/ Grantee Index
- * Fictitious Business Names Index (DBAs)
- * Property Sales
- * On-Line Purchases

THE BACK OF THIS CHECK CONTAINS A SECURITY MARK - DO NOT ACCEPT WITHOUT HOLDING AT AN ANGLE TO VERIFY SECURITY MARK



THE CITY OF SAN DIEGO
 AMERICA'S FINEST CITY

BANK OF AMERICA
 NORTHBROOK, ILLINOIS
 COMMERCIAL DISBURSEMENT ACCOUNT

WARRANT CHECK NO.

0001570894

GENERAL

AMOUNT

70-2328
719

05/03/2017

\$ 2,266.25

PAY ** TWO THOUSAND TWO HUNDRED SIXTY-SIX AND 25/100 DOLLARS *****

TO THE ORDER OF
 COUNTY OF SAN DIEGO ASSESSOR

VOID AFTER 180 DAYS
 PAYMENT WARRANTED BY

Mary J. Lewis
 Chief Financial Officer

Paul R. Mamedov
 City Treasurer

Security Feature Included Details on back

⑈0001570894⑈ ⑆071923284⑆ 7765201321⑈



Ernest J. Dronenburg, Jr.

COUNTY OF SAN DIEGO ASSESSOR/RECORDER/COUNTY CLERK

**ASSESSOR'S OFFICE**

1600 Pacific Highway, Suite 103
San Diego, CA 92101-2480
Tel. (619) 236-3771 * Fax (619) 557-4056

www.sdarcc.com

RECORDER/COUNTY CLERK'S OFFICE

1600 Pacific Highway, Suite 260
P.O. Box 121750 * San Diego, CA 92112-1750
Tel. (619)237-0502 * Fax (619)557-4155

Transaction #: 383977220170505

Deputy: KBAO

Location: COUNTY ADMINISTRATION BUILDING

05-May-2017 09:50

FEES:

2,216.25	Qty of 1 Fish & Game Neg Dec (1800) for Ref# 20170067
50.00	Qty of 1 Fish and Game Filing Fee for Ref# 20170372

2,266.25 TOTAL DUE

PAYMENTS:

2,266.25	Check
----------	-------

2,266.25 TENDERED

**SERVICES AVAILABLE AT
OFFICE LOCATIONS**

- * Tax Bill Address Changes
- * Records and Certified Copies:
Birth/ Marriage/ Death/ Real Estate
- * Fictitious Business Names (DBAs)
- * Marriage Licenses and Ceremonies
- * Assessor Parcel Maps
- * Property Ownership
- * Property Records
- * Property Values
- * Document Recordings

**SERVICES AVAILABLE ON-LINE AT
www.sdarcc.com**

- * Forms and Applications
- * Frequently Asked Questions (FAQs)
- * Grantor/ Grantee Index
- * Fictitious Business Names Index (DBAs)
- * Property Sales
- * On-Line Purchases
Assessor Parcel Maps
Property Characteristics
Recorded Documents

NOTICE OF EXEMPTION

(Check one or both)

TO: Recorder/County Clerk
P.O. Box 1750, MS A-33
1600 Pacific Hwy, Room 260
San Diego, CA 92101-2400

FROM: City of San Diego
Public Works Department
525 B Street, Suite 750, MS 908A
San Diego, CA 92101

Office of Planning and Research
1400 Tenth Street, Room 121
Sacramento, CA 95814

Project Name: 70th-Alvarado to Saranac Sidewalk

Project No. / WBS No.: B-17065.02.06

Project Location-Specific: The Project is located within the road right-of-way on the west side of 70th Street between Alvarado Road and Saranac Street within the College Area Community Planning Area (Council District 9).

Project Location-City/County: San Diego/San Diego

Description of nature and purpose of the Project: The Project will install approximately 600 linear feet (LF) of four- to five-foot wide concrete sidewalk and curb and gutter to replace the existing asphalt concrete (AC) walkway on the west side of 70th Street between Alvarado Road and Saranac Street. The Project also includes installation of new curb ramps, a two-foot tall gravity retaining wall, relocation of signs, and restriping along 70th Street. A four-foot tall chain link fence will be installed for pedestrian safety adjacent to the existing concrete channel at the intersection with Alvarado Road. The concrete channel will be protected-in-place. Minor ornamental vegetation removal will occur at the southern end of the project to accommodate the new sidewalk.

Name of Public Agency Approving Project: City of San Diego

Name of Person or Agency Carrying Out Project: City of San Diego Public Works Department
Contact: Jerry Jakubauskas; Phone: (619) 533-3755
525 B Street, Suite 750 (MS 908A), San Diego, CA 92101

Exempt Status: (CHECK ONE)

- Ministerial (Sec. 21080(b)(1); 15268);
- Declared Emergency (Sec. 21080(b)(3); 15269(a));
- Emergency Project (Sec. 21080(b)(4); 15269 (b)(c))
- Categorical Exemption: 15301 (Existing Facilities); and 15303 (New Construction or Conversion of Small Structures)

Reasons why project is exempt: The City of San Diego conducted an environmental review which determined that the project meets the categorical exemption criteria set forth in CEQA State Guidelines, Sections 15301 (Existing Facilities) which allows for the minor alteration of existing public facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination including existing highways and streets, sidewalks, gutters, and similar facilities; 15303 (New Construction or Conversion of Small Structures) which allows for the construction of new, small facilities; and where the exceptions listed in Section 15300.2 would not apply.

Lead Agency Contact Person: Jerry Jakubauskas

Telephone: (619) 533-3755

Revised May 2016

If filed by applicant:

1. Attach certified document of exemption finding.
2. Has a notice of exemption been filed by the public agency approving the project? () Yes () No

It is hereby certified that the City of San Diego has determined the above activity to be exempt from CEQA



Carrie Purcell, Assistant Deputy Director

February 26, 2019
Date

Check One:

- (X) Signed By Lead Agency
() Signed by Applicant

Date Received for Filing with County Clerk or OPR:

APPENDIX B
FIRE HYDRANT METER PROGRAM

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 1 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

1. **PURPOSE**

1.1 To establish a Departmental policy and procedure for issuance, proper usage and charges for fire hydrant meters.

2. **AUTHORITY**

2.1 All authorities and references shall be current versions and revisions.

2.2 San Diego Municipal Code (NC) Chapter VI, Article 7, Sections 67.14 and 67.15

2.3 Code of Federal Regulations, Safe Drinking Water Act of 1986

2.4 California Code of Regulations, Titles 17 and 22

2.5 California State Penal Code, Section 498B.0

2.6 State of California Water Code, Section 110, 500-6, and 520-23

2.7 Water Department Director

Reference

2.8 State of California Guidance Manual for Cross Connection Programs

2.9 American Water Works Association Manual M-14, Recommended Practice for Backflow Prevention

2.10 American Water Works Association Standards for Water Meters

2.11 U.S.C. Foundation for Cross Connection Control and Hydraulic Research Manual

3. **DEFINITIONS**

3.1 **Fire Hydrant Meter:** A portable water meter which is connected to a fire hydrant for the purpose of temporary use. (These meters are sometimes referred to as Construction Meters.)

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 2 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

- 3.2 **Temporary Water Use:** Water provided to the customer for no longer than twelve (12) months.
- 3.3 **Backflow Preventor:** A Reduced Pressure Principal Assembly connected to the outlet side of a Fire Hydrant Meter.

4. **POLICY**

- 4.1 The Water Department shall collect a deposit from every customer requiring a fire hydrant meter and appurtenances prior to providing the meter and appurtenances (see Section 7.1 regarding the Fees and Deposit Schedule). The deposit is refundable upon the termination of use and return of equipment and appurtenances in good working condition.
- 4.2 Fire hydrant meters will have a 2 ½" swivel connection between the meter and fire hydrant. The meter shall not be connected to the 4" port on the hydrant. All Fire Hydrant Meters issued shall have a Reduced Pressure Principle Assembly (RP) as part of the installation. Spanner wrenches are the only tool allowed to turn on water at the fire hydrant.
- 4.3 The use of private hydrant meters on City hydrants is prohibited, with exceptions as noted below. All private fire hydrant meters are to be phased out of the City of San Diego. All customers who wish to continue to use their own fire hydrant meters must adhere to the following conditions:
 - a. Meters shall meet all City specifications and American Water Works Association (AWWA) standards.
 - b. Customers currently using private fire hydrant meters in the City of San Diego water system will be allowed to continue using the meter under the following conditions:
 - 1. The customer must submit a current certificate of accuracy and calibration results for private meters and private backflows annually to the City of San Diego, Water Department, Meter Shop.

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 3 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

2. The meter must be properly identifiable with a clearly labeled serial number on the body of the fire hydrant meter. The serial number shall be plainly stamped on the register lid and the main casing. Serial numbers shall be visible from the top of the meter casing and the numbers shall be stamped on the top of the inlet casing flange.
3. All meters shall be locked to the fire hydrant by the Water Department, Meter Section (see Section 4.7).
4. All meters shall be read by the Water Department, Meter Section (see Section 4.7).
5. All meters shall be relocated by the Water Department, Meter Section (see Section 4.7).
6. These meters shall be tested on the anniversary of the original test date and proof of testing will be submitted to the Water Department, Meter Shop, on a yearly basis. If not tested, the meter will not be allowed for use in the City of San Diego.
7. All private fire hydrant meters shall have backflow devices attached when installed.
8. The customer must maintain and repair their own private meters and private backflows.
9. The customer must provide current test and calibration results to the Water Department, Meter Shop after any repairs.
10. When private meters are damaged beyond repair, these private meters will be replaced by City owned fire hydrant meters.

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 4 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

11. When a private meter malfunctions, the customer will be notified and the meter will be removed by the City and returned to the customer for repairs. Testing and calibration results shall be given to the City prior to any re-installation.
 12. The register shall be hermetically sealed straight reading and shall be readable from the inlet side. Registration shall be in hundred cubic feet.
 13. The outlet shall have a 2 ½ “National Standards Tested (NST) fire hydrant male coupling.
 14. Private fire hydrant meters shall not be transferable from one contracting company to another (i.e. if a company goes out of business or is bought out by another company).
- 4.4 All fire hydrant meters and appurtenances shall be installed, relocated and removed by the City of San Diego, Water Department. All City owned fire hydrant meters and appurtenances shall be maintained by the City of San Diego, Water Department, Meter Services.
- 4.5 If any fire hydrant meter is used in violation of this Department Instruction, the violation will be reported to the Code Compliance Section for investigation and appropriate action. Any customer using a fire hydrant meter in violation of the requirements set forth above is subject to fines or penalties pursuant to the Municipal Code, Section 67.15 and Section 67.37.
- 4.6 Conditions and Processes for Issuance of a Fire Hydrant Meter**
- Process for Issuance
- a. Fire hydrant meters shall only be used for the following purposes:
 1. Temporary irrigation purposes not to exceed one year.

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 5 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

2. Construction and maintenance related activities (see Tab 2).
 - b. No customer inside or outside the boundaries of the City of San Diego Water Department shall resell any portion of the water delivered through a fire hydrant by the City of San Diego Water Department.
 - c. The City of San Diego allows for the issuance of a temporary fire hydrant meter for a period not to exceed 12 months (365 days). An extension can only be granted in writing from the Water Department Director for up to 90 additional days. A written request for an extension by the consumer must be submitted at least 30 days prior to the 12 month period ending. No extension shall be granted to any customer with a delinquent account with the Water Department. No further extensions shall be granted.
 - d. Any customer requesting the issuance of a fire hydrant meter shall file an application with the Meter Section. The customer must complete a "Fire Hydrant Meter Application" (Tab 1) which includes the name of the company, the party responsible for payment, Social Security number and/or California ID, requested location of the meter (a detailed map signifying an exact location), local contact person, local phone number, a contractor's license (or a business license), description of specific water use, duration of use at the site and full name and address of the person responsible for payment.
 - e. At the time of the application the customer will pay their fees according to the schedule set forth in the Rate Book of Fees and Charges, located in the City Clerk's Office. All fees must be paid by check, money order or cashiers check, made payable to the City Treasurer. Cash will not be accepted.
 - f. No fire hydrant meters shall be furnished or relocated for any customer with a delinquent account with the Water Department.
 - g. After the fees have been paid and an account has been created, the

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 6 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

meter shall be installed within 48 hours (by the second business day). For an additional fee, at overtime rates, meters can be installed within 24 hours (within one business day).

4.7 Relocation of Existing Fire Hydrant Meters

- a. The customer shall call the Fire Hydrant Meter Hotline (herein referred to as “Hotline”), a minimum of 24 hours in advance, to request the relocation of a meter. A fee will be charged to the existing account, which must be current before a work order is generated for the meter’s relocation.
- b. The customer will supply in writing the address where the meter is to be relocated (map page, cross street, etc). The customer must update the original Fire Hydrant Meter Application with any changes as it applies to the new location.
- c. Fire hydrant meters shall be read on a monthly basis. While fire hydrant meters and backflow devices are in service, commodity, base fee and damage charges, if applicable, will be billed to the customer on a monthly basis. If the account becomes delinquent, the meter will be removed.

4.8 Disconnection of Fire Hydrant Meter

- a. After ten (10) months a “Notice of Discontinuation of Service” (Tab 3) will be issued to the site and the address of record to notify the customer of the date of discontinuance of service. An extension can only be granted in writing from the Water Department Director for up to 90 additional days (as stated in Section 4.6C) and a copy of the extension shall be forwarded to the Meter Shop Supervisor. If an extension has not been approved, the meter will be removed after twelve (12) months of use.
- b. Upon completion of the project the customer will notify the Meter Services office via the Hotline to request the removal of the fire hydrant meter and appurtenances. A work order will be generated

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 7 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

for removal of the meter.

- c. Meter Section staff will remove the meter and backflow prevention assembly and return it to the Meter Shop. Once returned to the Meter Shop the meter and backflow will be tested for accuracy and functionality.
- d. Meter Section Staff will contact and notify Customer Services of the final read and any charges resulting from damages to the meter and backflow or its appurtenance. These charges will be added on the customer's final bill and will be sent to the address of record. Any customer who has an outstanding balance will not receive additional meters.
- e. Outstanding balances due may be deducted from deposits and any balances refunded to the customer. Any outstanding balances will be turned over to the City Treasurer for collection. Outstanding balances may also be transferred to any other existing accounts.

5. **EXCEPTIONS**

- 5.1 Any request for exceptions to this policy shall be presented, in writing, to the Customer Support Deputy Director, or his/her designee for consideration.

6. **MOBILE METER**

- 6.1 Mobile meters will be allowed on a case by case basis. All mobile meters will be protected by an approved backflow assembly and the minimum requirement will be a Reduced Pressure Principal Assembly. The two types of Mobile Meters are vehicle mounted and floating meters. Each style of meters has separate guidelines that shall be followed for the customer to retain service and are described below:

- a) **Vehicle Mounted Meters:** Customer applies for and receives a City owned Fire Hydrant Meter from the Meter Shop. The customer mounts the meter on the vehicle and brings it to the Meter Shop for

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 8 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

inspection. After installation is approved by the Meter Shop the vehicle and meter shall be brought to the Meter Shop on a monthly basis for meter reading and on a quarterly basis for testing of the backflow assembly. Meters mounted at the owner's expense shall have the one year contract expiration waived and shall have meter or backflow changed if either fails.

b) **Floating Meters:** Floating Meters are meters that are not mounted to a vehicle. **(Note: All floating meters shall have an approved backflow assembly attached.)** The customer shall submit an application and a letter explaining the need for a floating meter to the Meter Shop. The Fire Hydrant Meter Administrator, after a thorough review of the needs of the customer, (i.e. number of jobsites per day, City contract work, lack of mounting area on work vehicle, etc.), may issue a floating meter. At the time of issue, it will be necessary for the customer to complete and sign the "Floating Fire Hydrant Meter Agreement" which states the following:

- 1) The meter will be brought to the Meter Shop at 2797 Caminito Chollas, San Diego on the third week of each month for the monthly read by Meter Shop personnel.
- 2) Every other month the meter will be read and the backflow will be tested. This date will be determined by the start date of the agreement.

If any of the conditions stated above are not met the Meter Shop has the right to cancel the contract for floating meter use and close the account associated with the meter. The Meter Shop will also exercise the right to refuse the issuance of another floating meter to the company in question.

Any Fire Hydrant Meter using reclaimed water shall not be allowed use again with any potable water supply. The customer shall incur the cost of replacing the meter and backflow device in this instance.

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 9 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

7. **FEE AND DEPOSIT SCHEDULES**

7.1 **Fees and Deposit Schedules:** The fees and deposits, as listed in the Rate Book of Fees and Charges, on file with the Office of the City Clerk, are based on actual reimbursement of costs of services performed, equipment and materials. These deposits and fees will be amended, as needed, based on actual costs. Deposits, will be refunded at the end of the use of the fire hydrant meter, upon return of equipment in good working condition and all outstanding balances on account are paid. Deposits can also be used to cover outstanding balances.

All fees for equipment, installation, testing, relocation and other costs related to this program are subject to change without prior notification. The Mayor and Council will be notified of any future changes.

8. **UNAUTHORIZED USE OF WATER FROM A HYDRANT**

8.1 Use of water from any fire hydrant without a properly issued and installed fire hydrant meter is theft of City property. Customers who use water for unauthorized purposes or without a City of San Diego issued meter will be prosecuted.

8.2 If any unauthorized connection, disconnection or relocation of a fire hydrant meter, or other connection device is made by anyone other than authorized Water Department personnel, the person making the connection will be prosecuted for a violation of San Diego Municipal Code, Section 67.15. In the case of a second offense, the customer's fire hydrant meter shall be confiscated and/or the deposit will be forfeited.

8.3 Unauthorized water use shall be billed to the responsible party. Water use charges shall be based on meter readings, or estimates when meter readings are not available.

8.4 In case of unauthorized water use, the customer shall be billed for all applicable charges as if proper authorization for the water use had been obtained, including but not limited to bi-monthly service charges, installation charges and removal charges.

CITY OF SAN DIEGO CALIFORNIA DEPARTMENT INSTRUCTIONS	NUMBER DI 55.27	DEPARTMENT Water Department
SUBJECT FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)	PAGE 10 OF 10	EFFECTIVE DATE October 15, 2002
	SUPERSEDES DI 55.27	DATED April 21, 2000

- 8.5 If damage occurs to Water Department property (i.e. fire hydrant meter, backflow, various appurtenances), the cost of repairs or replacements will be charged to the customer of record (applicant).

Water Department Director

- Tabs: 1. Fire Hydrant Meter Application
2. Construction & Maintenance Related Activities With No Return To Sewer
3. Notice of Discontinuation of Service

APPENDIX

Administering Division: Customer Support Division

Subject Index: Construction Meters
Fire Hydrant
Fire Hydrant Meter Program
Meters, Floating or Vehicle Mounted
Mobile Meter
Program, Fire Hydrant Meter

Distribution: DI Manual Holders



Application for Fire Hydrant Meter (EXHIBIT A)

(For Office Use Only)

NS REQ	FAC#
DATE	BY

METER SHOP (619) 527-7449

Meter Information

Application Date	Requested Install Date:
------------------	-------------------------

Fire Hydrant Location: (Attach Detailed Map//Thomas Bros. Map Location or Construction drawing.) Zip:	T.B.	G.B. (CITY USE)
Specific Use of Water:		
Any Return to Sewer or Storm Drain, if so, explain:		
Estimated Duration of Meter Use:	<input type="checkbox"/>	<input type="checkbox"/> Check Box if Reclaimed Water

Company Information

Company Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ()
*Business license#		*Contractor license#	
A Copy of the Contractor's license OR Business License is required at the time of meter issuance.			
Name and Title of Billing Agent: <small>(PERSON IN ACCOUNTS PAYABLE)</small>			Phone: ()
Site Contact Name and Title:			Phone: ()
Responsible Party Name:			Title:
Cal ID#			Phone: ()
Signature:		Date:	
<small>Guarantees Payment of all Charges Resulting from the use of this Meter. Insures that employees of this Organization understand the proper use of Fire Hydrant Meter</small>			

Fire Hydrant Meter Removal Request	Requested Removal Date:
Provide Current Meter Location if Different from Above:	
Signature:	Title: Date:
Phone: ()	Pager: ()

<input type="checkbox"/> City Meter	<input type="checkbox"/> Private Meter	
Contract Acct #:	Deposit Amount: \$ 936.00	Fees Amount: \$ 62.00
Meter Serial #	Meter Size: 05	Meter Make and Style: 6-7
Backflow #	Backflow Size:	Backflow Make and Style:
Name:	Signature:	Date:

WATER USES WITHOUT ANTICIPATED CHARGES FOR RETURN TO SEWER

Auto Detailing
Backfilling
Combination Cleaners (Vactors)
Compaction
Concrete Cutters
Construction Trailers
Cross Connection Testing
Dust Control
Flushing Water Mains
Hydro Blasting
Hydro Seeing
Irrigation (for establishing irrigation only; not continuing irrigation)
Mixing Concrete
Mobile Car Washing
Special Events
Street Sweeping
Water Tanks
Water Trucks
Window Washing

Note:

1. If there is any return to sewer or storm drain, then sewer and/or storm drain fees will be charges.

Date

Name of Responsible Party
Company Name and Address
Account Number: _____

Subject: Discontinuation of Fire Hydrant Meter Service

Dear Water Department Customer:

The authorization for use of Fire Hydrant Meter # _____, located at *(Meter Location Address)* ends in 60 days and will be removed on or after *(Date Authorization Expires)*. Extension requests for an additional 90 days must be submitted in writing for consideration 30 days prior to the discontinuation date. If you require an extension, please contact the Water Department, or mail your request for an extension to:

City of San Diego
Water Department
Attention: Meter Services
2797 Caminito Chollas
San Diego, CA 92105-5097

Should you have any questions regarding this matter, please call the Fire Hydrant Hotline at (619) _____ - _____.

Sincerely,

Water Department

APPENDIX C

MATERIALS TYPICALLY ACCEPTED BY CERTIFICATE OF COMPLIANCE

MATERIALS TYPICALLY ACCEPTED BY CERTIFICATE OF COMPLIANCE

1. Soil amendment
2. Fiber mulch
3. PVC or PE pipe up to 16 inch diameter
4. Stabilizing emulsion
5. Lime
6. Preformed elastomeric joint seal
7. Plain and fabric reinforced elastomeric bearing pads
8. Steel reinforced elastomeric bearing pads
9. Waterstops (Special Condition)
10. Epoxy coated bar reinforcement
11. Plain and reinforcing steel
12. Structural steel
13. Structural timber and lumber
14. Treated timber and lumber
15. Lumber and timber
16. Aluminum pipe and aluminum pipe arch
17. Corrugated steel pipe and corrugated steel pipe arch
18. Structural metal plate pipe arches and pipe arches
19. Perforated steel pipe
20. Aluminum underdrain pipe
21. Aluminum or steel entrance tapers, pipe downdrains, reducers, coupling bands and slip joints
22. Metal target plates
23. Paint (traffic striping)
24. Conductors
25. Painting of electrical equipment
26. Electrical components
27. Engineering fabric
28. Portland Cement
29. PCC admixtures
30. Minor concrete, asphalt
31. Asphalt (oil)
32. Liquid asphalt emulsion
33. Epoxy

APPENDIX D

SAMPLE CITY INVOICE WITH CASH FLOW FORECAST

City of San Diego, CM&FS Div., 9753 Chesapeake Drive, SD CA 92123

Project Name:
Work Order No or Job Order No.
City Purchase Order No.
Resident Engineer (RE):
RE Phone#: Fax#:

Contractor's Name:
Contractor's Address:

Contractor's Phone #:
Contractor's fax #:
Contact Name:

Invoice No.
Invoice Date:
Billing Period: (To)

Item #	Item Description	Contract Authorization				Previous Totals To Date		This Estimate		Totals to Date	
		Unit	Price	Qty	Extension	%/QTY	Amount	% / QTY	Amount	% / QTY	Amount
1					\$ -		\$ -		\$ -	0.00%	\$ -
2					\$ -		\$ -		\$ -	0.00%	\$ -
3					\$ -		\$ -		\$ -	0.00%	\$ -
4					\$ -		\$ -		\$ -	0.00%	\$ -
5					\$ -		\$ -		\$ -	0.00%	\$ -
6					\$ -		\$ -		\$ -	0.00%	\$ -
7					\$ -		\$ -		\$ -	0.00%	\$ -
8					\$ -		\$ -		\$ -	0.00%	\$ -
5					\$ -		\$ -		\$ -	0.00%	\$ -
6					\$ -		\$ -		\$ -	0.00%	\$ -
7					\$ -		\$ -		\$ -	0.00%	\$ -
8					\$ -		\$ -		\$ -	0.00%	\$ -
9					\$ -		\$ -		\$ -	0.00%	\$ -
10					\$ -		\$ -		\$ -	0.00%	\$ -
11					\$ -		\$ -		\$ -	0.00%	\$ -
12					\$ -		\$ -		\$ -	0.00%	\$ -
13					\$ -		\$ -		\$ -	0.00%	\$ -
14					\$ -		\$ -		\$ -	0.00%	\$ -
15					\$ -		\$ -		\$ -	0.00%	\$ -
16					\$ -		\$ -		\$ -	0.00%	\$ -
17	Field Orders				\$ -		\$ -		\$ -	0.00%	\$ -
	CHANGE ORDER No.				\$ -		\$ -		\$ -	0.00%	\$ -
					\$ -		\$ -		\$ -	0.00%	\$ -
Total Authorized Amount (including approved Change Order)					\$ -		\$ -		\$ -	Total Billed	\$ -

SUMMARY

A. Original Contract Amount	\$ -
B. Approved Change Order #00 Thru #00	\$ -
C. Total Authorized Amount (A+B)	\$ -
D. Total Billed to Date	\$ -
E. Less Total Retention (5% of D)	\$ -
F. Less Total Previous Payments	\$ -
G. Payment Due Less Retention	\$0.00
H. Remaining Authorized Amount	\$0.00

I certify that the materials
have been received by me in
the quality and quantity specified

Resident Engineer

Construction Engineer

Retention and/or Escrow Payment Schedule

Total Retention Required as of this billing (Item E)	\$0.00
Previous Retention Withheld in PO or in Escrow	\$0.00
Add'l Amt to Withhold in PO/Transfer in Escrow:	\$0.00
Amt to Release to Contractor from PO/Escrow:	

Contractor Signature and Date: _____

NOTE: CONTRACTOR TO CALCULATE TO THE 2ND DECIMAL PLACE.

WBS #:	B18108
Date Submitted:	10/10/2018
NTP Date:	3/23/2018
Final Statement of WD Date:	5/23/2020
Contract #:	K-XX-XXXX-XXX-X
Contract Amount:	\$5,617,000

Construction Cash Flow Forecast

"Sewer and Water Group Job 965 (W)"

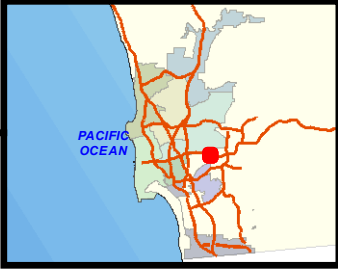
Year	January	February	March	April	May	June	July	August	September	October	November	December
2018				15,000	25,000	52,000	52,000	100,000	10,000	100,000	100,000	100,000
2019	10,000	10,000	85,000	58,000	100,000	100,000	100,000	100,000	100,000	100,000	1,000,000	1,000,000
2020	100,000	100,000	100,000	1,000,000	1,000,000							
2021												
2022												
2023												
2024												
2025												

SAMPLE REFERENCE

APPENDIX E
LOCATION MAPS

The City of
SAN DIEGO Public Works
Mid-City Pipeline Project - Phase 2

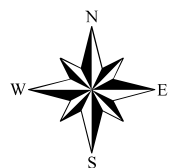
FOR QUESTIONS ABOUT THIS PROJECT
 Call: (619) 533-4207
 Email: engineering@sandiego.gov



ALVARADO WATER TREATMENT PLANT

Legend

- Tunnel Crossing
- 8 inch Main
- Service Transfer
- Mid-City Pipeline Ph 2
- Abandonment



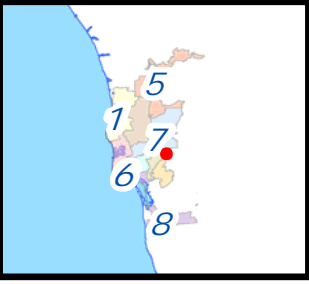
THIS MAP/DATA IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Note: This product may contain information reproduced with permission granted by RAND McNALLY & COMPANY to SanGIS. This map is copyrighted by RAND McNALLY & COMPANY. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without the prior written permission of RAND McNALLY & COMPANY.

70TH ALVARADO TO SARANAC SIDEWALK

FOR QUESTIONS ABOUT THIS PROJECT

Call: 619-533-4207

Email: engineering@sandiego.gov



Legend

- Proposed New Sidewalk
- Existing Curb Ramp Replacement



THIS MAP/DATA IS PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OR MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Note: This product may contain information reproduced with permission granted by RAND MCNALLY & COMPANY to SanGIS. This map is copyrighted by RAND MCNALLY & COMPANY. It is unlawful to copy or reproduce all or any part thereof, whether for personal use or resale, without the prior, written permission of RAND MCNALLY & COMPANY.

APPENDIX F

SWPPP CONSTRUCTION BMP MAINTENANCE LOG

SWPPP Construction BMP Maintenance Log

Examples of construction BMP maintenance activities include but are not limited to tasks listed below. The contractor is ultimately responsible for compliance with the Storm Water Standards Manual and/or the Construction General Permit, and for ensuring all BMPs function per manufacturer's specifications. Use the attached log to schedule and document maintenance activities. The log shall be kept with the project SWPPP document at all times.

Construction BMP Maintenance Activities

- Maintain stabilized construction entrances/exits
- Redress gravel/rock to full coverage and remove any sediment accumulation
- Remove and replace geotextile/compost blanket/plastic with holes or tears
- Redress and restabilize erosion or rilling greater than 1-inch deep
- Reapply hydraulic stabilization products to full coverage
- Remove and replace silt fence/fiber roll/gravel bags/etc. with holes or tears
- Reinstall or replace silt fence/fiber roll/etc. with sags
- Remove sediment accumulation from perimeter controls
- Remove sediment accumulation from storm drain inlet protection and check dams
- Remove sediment accumulation from energy dissipators
- Repair or remove any vehicle/equipment that leaks
- Remove any accumulation in drip pans or containment
- Empty concrete washouts when they reach 75% capacity
- Empty waste disposal containers when they reach 95% capacity

Construction BMP Maintenance Log

Project Title:

WBS/IO No:

WDID:

Scheduled Date/Time	Completion Date/Time	Location	Maintenance Tasks Performed	Logged By

APPENDIX G

CONTRACTOR'S DAILY QUALITY CONTROL INSPECTION REPORT

Appendix_G

City of San Diego
Asphalt Concrete Overlay

Contractor's Daily Quality Control Inspection Report

Project Title: _____ Date: _____

Locations: 1. _____
2. _____
3. _____

Asphalt Mix Specification: Attached Supplier: _____

Dig out Locations: 1. _____
2. _____
3. _____

Tack Coat Application Rate @ Locations:
1. _____
2. _____
3. _____

Asphalt Temperature at Placement @ Locations:
1. _____
2. _____
3. _____

Asphalt Depth @Locations:
1. _____
2. _____
3. _____

Compaction Test Result @Locations:
1. _____
2. _____
3. _____

Location and nature of defects:

- 1. _____
- 2. _____
- 3. _____

Remedial and Corrective Actions taken or proposed for Engineer's approval:

- 1. _____
- 2. _____
- 3. _____

Date's City Laboratory representative was present:

- 1. _____
- 2. _____
- 3. _____

Verified the following:

- 1. Proper Storage of Materials & Equipment
- 2. Proper Operation of Equipment
- 3. Adherence to Plans and Specs
- 4. Review of QC Tests
- 5. Safety Inspection

Initials:

- _____
- _____
- _____
- _____
- _____

Deviations from QCP _____ (see attached)

Quality Control Plan Administrator's Signature:

Date Signed:

APPENDIX H

MONTHLY DRINKING WATER DISCHARGE MONITORING FORM

DRINKING WATER DISCHARGE MONITORING FORM

(Use for All Discharges to the Storm Drain)

All discharge activities related to this project comply with the State Water Resources Control Board ORDER WQ 2014-0194-DWQ, STATEWIDE GENERAL NPDES PERMIT FOR DRINKING WATER SYSTEMS DISCHARGES as referenced by (http://www.waterboards.ca.gov/water_issues/programs/npdes/docs/drinkingwater/final_statewide_wqo2014_0194_dwq.pdf), and as follows:

Project Name:				WBS No.:			Watershed No.				
Qualified Person Conducting Tests:				signature							
BMPs MUST BE IN PLACE PRIOR TO ANY SCHEDULED DISCHARGE							By signing, I certify that all of the statements and conditions for drinking water discharge events are correct.				
Event #1											
Discharge Location ¹	Category ² (Select one)	Notification ³ (Select all that apply)	BMPs in Place ⁴ (Select all that apply)	Volume ⁵ (gal)	Sampling ⁶ (take samples at 10 mins, 50-60 mins & last 10 mins)			Exceedence ⁷			Notes Report exceedence to RE & complete page 2 of 2
					Measure	Unit	Time	Result	Limit	No	
Inlet Location	<input type="checkbox"/> Superchlorinated <small>(Chlorine added for disinfection)</small>	<input type="checkbox"/> TSW <small>(All Categories)</small>	<input type="checkbox"/> Sweep flow path <small>(gutter, street, etc.)</small>	Total	Chlorine	mg/L			0.1 mg/L= Exceedence		
	<input type="checkbox"/> Large Volume <small>(≥ 325,850 gal)</small>	<input type="checkbox"/> PUD <small>(All Categories)</small>	<input type="checkbox"/> Dechlorination <small>(diffusers, chemicals, etc.)</small>								
	<input type="checkbox"/> Well Dev/Rehab <small>(Not Typical)</small>	<input type="checkbox"/> Water Board <small>(Large Volume Only)</small>	<input type="checkbox"/> Inlet Protection	County <small>(≥100,000 gal & within ¼ mile of ocean/bay; or if enters the County's MS4)</small>	Sediment Controls	Unit			Range 6.5 to 8.5		
	<input type="checkbox"/> Small Volume/Other <small>(No Sampling Required)</small>										
Event #2											
Discharge Location ¹	Category ² (Select one)	Notification ³ (Select all that apply)	BMPs in Place ⁴ (Select all that apply)	Volume ⁵ (gal)	Sampling ⁶ (take samples at 10 mins, 50-60 mins & last 10 mins)			Exceedence ⁷			Notes Report exceedence to RE & complete page 2 of 2
					Measure	Unit	Time	Result	Limit	No	
Inlet Location	<input type="checkbox"/> Superchlorinated <small>(Chlorine added for disinfection)</small>	<input type="checkbox"/> TSW <small>(All Categories)</small>	<input type="checkbox"/> Sweep flow path <small>(gutter, street, etc.)</small>	Total	Chlorine	mg/L			0.1 mg/L= Exceedence		
	<input type="checkbox"/> Large Volume <small>(≥ 325,850 gal)</small>	<input type="checkbox"/> PUD <small>(All Categories)</small>	<input type="checkbox"/> Dechlorination <small>(diffusers, chemicals, etc.)</small>								
	<input type="checkbox"/> Well Dev/Rehab <small>(Not Typical)</small>	<input type="checkbox"/> Water Board <small>(Large Volume Only)</small>	<input type="checkbox"/> Inlet Protection	County <small>(≥100,000 gal & within ¼ mile of ocean/bay; or if enters the County's MS4)</small>	Sediment Controls	Unit			Range 6.5 to 8.5		
	<input type="checkbox"/> Small Volume/Other <small>(No Sampling Required)</small>										

Submit completed Form to RE

Instructional Notes found on the Page 2 of 2

Receiving Water Monitoring

(Complete only if limits exceed on Page 1 of 2)

Event #1	
1) Go to the location where the discharge enters the receiving water.	
<input type="checkbox"/> Accessible <input type="checkbox"/> Unable to Determine <input type="checkbox"/> No Safe Access	
2) If accessible, take photos and complete the visual monitoring below. If unable to determine, stop here. If no safe access, stop here.	
3) Visual Monitoring: Is the discharge into the receiving water...	
...causing erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No
...carrying floating or suspended matter	<input type="checkbox"/> Yes <input type="checkbox"/> No
...causing discoloration	<input type="checkbox"/> Yes <input type="checkbox"/> No
...causing and impact to the aquatic life present	<input type="checkbox"/> Yes <input type="checkbox"/> No
...observed with visible film	<input type="checkbox"/> Yes <input type="checkbox"/> No
...observed with an sheen or coating	<input type="checkbox"/> Yes <input type="checkbox"/> No
...causing potential nuisance conditions	<input type="checkbox"/> Yes <input type="checkbox"/> No
3) If all answers are NO, stop here.	
4) If any answers are YES, Notify the RE immediately for further action	

Event #2	
1) Go to the location where the discharge enters the receiving water.	
<input type="checkbox"/> Accessible <input type="checkbox"/> Unable to Determine <input type="checkbox"/> No Safe Access	
2) If accessible, take photos and complete the visual monitoring below. If unable to determine, stop here. If no safe access, stop here.	
3) Visual Monitoring: Is the discharge into the receiving water...	
...causing erosion	<input type="checkbox"/> Yes <input type="checkbox"/> No
...carrying floating or suspended matter	<input type="checkbox"/> Yes <input type="checkbox"/> No
...causing discoloration	<input type="checkbox"/> Yes <input type="checkbox"/> No
...causing and impact to the aquatic life present	<input type="checkbox"/> Yes <input type="checkbox"/> No
...observed with visible film	<input type="checkbox"/> Yes <input type="checkbox"/> No
...observed with an sheen or coating	<input type="checkbox"/> Yes <input type="checkbox"/> No
...causing potential nuisance conditions	<input type="checkbox"/> Yes <input type="checkbox"/> No
3) If all answers are NO, stop here.	
4) If any answers are YES, Notify the RE immediately for further action	

Instructional Notes to Contractor

- 1) Log the location of the inlet or discharge point. For example: Albatross St & 5th Av. Log the start date and time and the end date and time of the discharge.
- 2) Log the discharge category. "Superchlorinated" are discharges where additional chlorine is added in order to adequately disinfect and sanitize drinking water system facilities. This does NOT include potable water containing residual chlorine from the water treatment process. "Large Volume" discharges are greater than 325,850 gallons of total volume for one event. "Well Dev/Rehab" are discharges of potable ground water from a well. This is not typical. If none of these categories apply, then select "Small Volume/Other."
- 3) Notifications of the location, date, time, category, and estimated volume of discharge must be made to the contacts and per the requirements below:

Contact	Email	When to Notify
TSW	SWPPP@SanDiego.gov	3 days prior to all discharges
PUD	CompReports@SanDiego.gov RDavenport@sandiego.gov	3 days prior to all discharges
San Diego Water Board	SanDiego@WaterBoards.ca.gov cc:Ben.Neill@WaterBoards.ca.gov	3 days prior to a Large Volume discharge
County of San Diego	DEH: joseph.palmer@sdcounty.ca.gov dominique.edwards@sdcounty.ca.gov	3 days prior if ≥100,000 gal within ¼ mile of the ocean/bay
	WPP: Nicholas.DelValle@sdcounty.ca.gov	3 days prior if enters County's MS4 or unincorporated County

- 4) At a minimum, sweep gutters prior to starting discharge and use dechlorination BMPs. The contractor and RE must monitor and determine if BMPs need to be removed/modified. For example if inlet protection is causing flooding at a storm drain inlet, contractor may elect to remove BMPs. Document any modification to BMPs in notes section.
- 5) Total volume must be logged for all discharges. If discharge water is reused for other purposes such as watering a golf course, log that volume under "Reused"
- 6) Sampling is required for categories per the following table:

Category	Measure	Sample Frequency
Superchlorinated	Chlorine, Turbidity, pH	first 10 mins, 50-60 mins, last 10 mins
Large Volume	Chlorine, Turbidity	first 10 mins, 50-60 mins, last 10 mins
Well Dev/Rehab	Chlorine, Turbidity	first 10 mins, 50-60 mins, last 10 mins
Small Volume/Other	None	None

- 7) Effluent limitations must be monitored not to exceed per the following table:

Measure	Method	Limit
Volume	Estimate None	
Chlorine	Field Measurement	0.10 mg/L-Cl
Turbidity	Visual Estimate	20 NTU for inland water 225 NTU for ocean 100 NTU for well water
pH	Field Measurement	6.5 to 8.5

APPENDIX I
CALTRANS PERMIT

DEPARTMENT OF TRANSPORTATION**DISTRICT 11**

4050 TAYLOR STREET, M.S. 110
 SAN DIEGO, CA 92110
 PHONE (619) 688-6158
 FAX (619) 688-6157
 TTY 711
 www.dot.ca.gov



*Serious Drought.
 Serious drought.
 Help save water!*

April 4, 2016

Ref: 11-16-NMC-0034

Route: 11-SD-8/9.56

Ms. Alice Altes
 Project Manager
 City of San Diego
 525 B Street, Suite 750, MS 908A
 San Diego, CA 92101

Dear Ms. Altes:

The California Department of Transportation (Caltrans) reviewed your initial plan submittal to perform highway surface improvements and install water pipe line by jack and bore, for compliance with policy, design, and construction standards. The submittal requires the following revisions grouped by reviewing branch, before determining if the proposed work may be allowed:

General

1. Place the following information block in the upper right hand corner of all plan sheets:

PERMIT NUMBER	11-15-NMC-0034
CO SD RTE	8 PM 9.56
AS-BUILT PLANS FOR ROADWAY GEOMETRIC AND ABOVE GROUND FEATURES	
STATE REPRESENTATIVE	DATE

2. Specify the thickness of the carrier and casing pipes on plan sheets.

DTM

3. The traffic control plans are not acceptable based on the traffic volume at this location. You may revise the traffic control plans to accommodate the traffic volume at that location.
4. A meeting may be necessary to address this issue.

Traffic Engineering and Analysis

5. Address the issues in the enclosed memorandum dated February 16, 2016.

*"Provide a safe, sustainable, integrated and efficient transportation system
 to enhance California's economy and livability"*

April 4, 2016

Page 2

Inspector

6. Show grout port spacing.
7. Show thrust block at ends of casing.
8. Show the detail of the 21-inch brine line removal if it is in the bridge cell, and provide traffic handling plans for the removal work.
9. Any conflicting signs on the mast arms need to be covered.

Geotechnical

10. The monitoring of the volume of excavated and removed materials (cuttings) is imperative. Explain how this volume will be measured in relation to the anticipated volume.
11. Provide a comprehensive plan describing specific action will be taken to ensure that roadway safety is not compromised and that the roadway is refurbished.
12. A California Certified Engineering Geologist should log the tunneling operation.
13. Provide the most current hydrogeological evaluation report of the project.

Once comments are addressed, please submit 10 sets of new and/or revised 11" x 17" plan sheets, each sheet folded individually, to 8 1/2" x 11", in accordance with the enclosed folding instruction sheet.

Your submittal will not be considered complete if the requested information or a response is not received by May 4, 2016, and may be denied without prejudice and the file will be closed. You may contact the District Encroachment Permits Office in writing to request additional time if needed.

If you have any question, please contact your permit writer Samira Marei at (619) 688-6653 or by e-mail at samira.marei@dot.ca.gov.

Sincerely,



for ANN M. FOX
District Permit Engineer

Enclosures:

c: Permits
Michael Pollard
PSOMAS
3111 Camino Del Rio north, Suite 702
San Diego, ca 92108-5720

*"Provide a safe, sustainable, integrated and efficient transportation system
to enhance California's economy and livability"*

PSOMAS

401 B Street, Suite 1600 San Diego, CA 92101
Voice: 619-961-2800 Fax: 619-961-2392

Date: 07/19/18

Job No. 5SAN020900

Task 00999

Project: Montezuma/Mid-City Pipeline Phase II- City of San Diego (11-16-NMC-0034)

To: Ms. Anh Hoang - Office of Permits
619.718.7899

Department of Transportation (Caltrans District 11)
4050 Taylor Street, M.S. 110
San Diego, CA 92110-2737

We Are Transmitting:

Via:

For Your:

Please:

- Per Your Request
- Enclosed
- Under separate cover
- Prints
- Transparencies
- Specifications
- DVD/CD/Diskettes

- Mail
- Overnight
- UPS
- Messenger
- Hand
- Fed Ex
- Fax
- FTP / E-Mail

- Approval
- Review and Comment
- Distribution
- Information/Files
- Signature

- Acknowledge
- Return Enclosures
- Respond By:

Enclosures:....(If enclosures are not as noted, please inform us immediately.)

Qty:	Description:	Date:
10	11x17 Z-folded Construction Plans	7/19/18
10	11x17 Z-folded Traffic Control Plans	7/19/18
1	Caltrans Comment Letter Dated 16 Feb 2018	7/19/18
1	Caltrans Structures Comments Email Dated 8 March 2018	7/19/18
1	PSOMAS and Darnell & Associates comment responses	7/19/18
1	Completed Lane Requirement Chart Request Form	7/19/18
1	Documentation Packet for Caltrans Right-of-Way Relinquishment at Alvarado Rd & 70th Street	7/19/18
1	Cal OSHA Letter for Underground Classification of Tunnels	7/19/18

Remarks:

Please find the listed items for the Encroachment Permit Application resubmittal. Thank you.

Issued By: Mike Ramos 
Copies To:

APPENDIX J
CALTRANS ENCROACHMENT PERMIT GUIDELINES AND SPECIFICATIONS



CALTRANS ENCROACHMENT PERMITS

GUIDELINES AND SPECIFICATIONS FOR TRENCHLESS TECHNOLOGY PROJECTS

AUGUST 2018

TABLE OF CONTENTS

PROCEDURAL REQUIREMENTS FOR DESIGN AND CALCULATIONS OF STRUCTURAL AND SUB-STRUCTURAL PROJECTS	3
Structural Design and Calculations	3
Substructural Design and Calculations	3
Project Owner's Responsibilities	4
Contractor's Responsibilities	4
TUNNELING PROJECTS	5
Cal/Osha Requirements	5
Tunnel	6
Tunnel Shield	6
Tunnel Lining	6
Lagging	7
Construction of Shafts and Pits	7
Placement of Shafts and Pits	7
Excavation	8
Dewatering	8
Grouting	8
Materials	9
Project Owner's Responsibilities	9
Contractor's Responsibilities	10
ENCASEMENT REQUIREMENTS	11
BORE & JACK	12
Bore and Receiving Pits	12
HORIZONTAL DIRECTIONAL DRILLING	13
Soil Investigations	13
Pre-construction & Site Evaluation	14
Installation Requirements	14
Permittee/Contractor Responsibilities	15
Drilling Fluids Management Plan	16
Previous Experience	16
Safety	16
Contingency Plans	17
Communications Plan	17
Drilling Operations	17
Equipment Setup and Site Layout	17
Drilling and Back-Reaming	17
Break-away Pulling Head	17
Protective Coatings	18
Drilling Fluid - collection and disposal practices	18
Site Restoration and Post Construction Evaluation	18
MICRO-TUNNELING	19
Micro-tunneling Plan Set Submittal	19
Contractor's Submittal	20
PIPE RAMMING	21
PIPE BURSTING	22

PROCEDURAL REQUIREMENTS FOR DESIGN AND CALCULATIONS OF STRUCTURAL AND SUB-STRUCTURAL PROJECTS

All submittals shall be stamped by a Registered Structural Engineer, or a Registered Civil Engineer, with a minimum of five years' experience in structural design and preparation of calculations, proof of experience is required by use of Encroachment Permits form "Certification of Structural Experience" (form TR-0133) to be included within the project package submittal.

STRUCTURAL DESIGN AND CALCULATIONS

All Structural Project submittals (structures and structural falsework) will require review by Structures Maintenance, for construction under an encroachment permit and require the following:

Designed plans and specifications, calculations and details (structural and falsework).

A geotechnical investigation and soil analysis by a licensed geotechnical engineer is required. It shall provide identification of any locations of difficulty, changes in soil formation, or mixed face conditions that could present or create ground loss, exploratory soil corings and logs are required along the alignment of the project.

Construction or Structures Construction may provide oversight.

SUB-STRUCTURAL DESIGN AND CALCULATIONS

Sub-structural projects may consist of, but are not limited to, drainage boxes & systems, tunneling projects (mechanical or manual tunnel excavations for the placement of tunnel supports), and Trenchless Technologies for the installation of utilities when the diameter is 30" or larger (jack & bore, micro-tunneling, horizontal directional drilling, or pipe-ramming).

When the distance between the tunnel and an existing structure is less than twenty times its diameter, it shall be sent to Structures Maintenance for review of the potential lateral loading effects to the pilings and foundation.

Otherwise, Sub-structural Project submittals, listed below and submitted with the "Certification of Experience" (form TR-0133) **do not** require review by Structures Maintenance or Underground Structures.

- Micro-tunneling projects.
- Bore & Jack, HDD, or Pipe Ramming (hole-diameter is 30" or larger and requiring structural/sub-structural design, investigations and calculations)
- Tunneling for the placement of tunnel support systems (rib & lagging, or steel liner plate requiring structural/sub-structural design, investigations and calculations).
- Drainage boxes and systems.

All Sub-structural Project submittals require the following:

The District Encroachment Permits Office is responsible for verification of the Registered Engineer's stamp, validation of the date of expiration against the dated plan set and calculations. The permit office engineer shall validate the RE's stamp at the web site listed below, by entering the RE's number. A copy of the results shall be printed and included within the permit file. The encroachment permit may be issued, upon completion of the normal review process (Traffic, Environmental, R/W, etc.).

- Designed plans and specifications, calculations and details (liner plates, rib & lagging, bracing, etc.).
- A geotechnical investigation and soil analysis by a licensed geotechnical engineer is required. It shall provide identification of any locations of difficulty, changes in soil formation, or mixed face conditions that could present or create ground loss, exploratory soil corings and logs are required along the alignment of the project.
- When the length of the tunnel is greater than four hundred feet (> 400'), alignment holes may be required. Alignment holes shall be drilled at a maximum spacing of two-hundred feet (200') and a casing of four to six inches (4" to 6") in diameter installed vertically, to a depth necessary for the installed casing to extend into the tunnel excavation. When alignment holes fall within the pavement area of the roadway, the pavement shall be saw-cut, a cover shall be placed over the end of the casing at grade, and the space around the casing within the roadway filled with concrete (EXCEPT in controlled access right-of-way).

PROJECT OWNER'S RESPONSIBILITIES

On projects deemed by the Department as requiring full time inspection, the project owner is responsible for providing a third-party full-time inspector.

A full-time Safety Engineer: A Registered Structural or Civil Engineer, with a minimum of five years' experience in design or inspection of Sub-structural Projects (tunnels). Proof of experience shall be submitted on Encroachment Permits form "Certification of Structural Experience" (form TR-0133) **or**

A full-time Safety Representative: State certified by Department of Industrial Relations, Cal/OSHA Mining & Tunnel Unit, proof of certification is required. California Code of Regulations 8406(f), (h)

CONTRACTOR'S RESPONSIBILITIES

Prior to issuance of the "DP" permit the following shall be submitted:

- Proof of experience, as stipulated by the District Office, in respect to diameter and length of proposed project.
- Tunnel support system construction plans and specifications, calculations and details, method of construction, to include the adequacy of the shield and liner material stamped by a Registered Structural Engineer, or a Registered Civil Engineer, with a minimum of five (5) years' experience in sub-structural design and preparation of calculations.
- "Notice of Materials to be used" (form CEM-3101).
- Method of construction plan.
- A Licensed Surveyor.
- Proof of rib expanders and/or liner supports.
- Working schedule of the project.
- Contingency plan for dealing with ground loss work.
- Shaft; soil stability at portals and ground improvement plan.
- Dewatering plans for entry and exit shafts/pits, if needed.
- Installation and monitoring of SWPPP or WPCP facilities and conditions.
- Shoring design for entry and exit shafts/pits.
- Survey control plan: lasers, laser mounting, laser checking.
- Ground surface settlement monuments and subsurface settlement monuments monitoring program plan.
 - Buried points

TUNNELING PROJECTS

All projects will vary in their own characteristics. General similarities are listed below to provide a general understanding of these types of projects.

Establishment of a survey-grid line and existing elevation points shall be over the centerline and wing points of the installation.

Designed plans and specifications, calculations and details (liner plates, rib & lagging, bracing, etc.) shall be stamped by a Registered Structural Engineer, or a Registered Civil Engineer, with a minimum of five (5) years' experience in sub-structural design of tunnels. Proof of experience shall be submitted on "Certification of Structural Experience" (form TR-0133) in conjunction with project package submittal.

A geotechnical investigation and soil analysis by a licensed geotechnical engineer/engineering geologist is required. It shall provide identification of any locations of difficulty, changes in soil formation, or mixed face conditions that could present or create ground loss, exploratory soil corings and logs are required along the tunnel alignment at intervals of twenty-five to one-hundred feet {25' to 100' }.

When the length of the tunnel is greater than four hundred feet (> 400'), alignment holes may be required. Alignment holes shall be drilled at a maximum spacing of two-hundred feet (200') and a casing of four to six inches (4" to 6") in diameter installed vertically, to a depth necessary for the installed casing to extend into the tunnel excavation. When alignment holes fall within the pavement area of the roadway, the pavement shall be saw-cut, a cover shall be placed over the end of the casing at grade, and the space around the casing within the roadway filled with concrete (EXCEPT in controlled access right-of-way).

CAL/OSHA REQUIREMENTS

The California Code of Regulations (CCR) mandates the following requirements for Tunneling Projects.

- The Owner or Local Entity proposing the construction of the tunnel shall make a full submittal to the Department of Industrial Relations, Cal/OSHA, to determine tunnel classification. CCR 8422
- Development of a check-in/check-out procedure to ensure an accurate account of personnel underground in the event of an emergency. CCR 8410
- Development of an Emergency Plan, that outlines duties and responsibilities of all personnel on the project during an emergency. The plan shall include ventilation controls, firefighting equipment, rescue procedures, evacuation plans and communications. CCR 8426
- Cal/OSHA requires a State of California certified person performing the duties of gas tester or safety representative to be certified by passing a written and an oral examination administered by the Cal/OSHA Mining & Tunneling Unit. CCR 8406(f), (h)
- A certified safety representative shall direct the required safety and health program and must be on-site while employees are engaged in operations during which the Tunnel Safety Orders (TSO) apply. CCR 8406(f)
- The certified safety representative must have knowledge in underground safety, must be able to recognize hazards, and must have the authority to correct unsafe conditions and procedures subject to the TSO. CCR 8406(f)

A State of California certified gas tester is required for the following operations:

- All classifications other than non-gassy
- Projects during which diesel equipment is used underground
- Hazardous underground gas conditions. CCR 8470

TUNNEL

Tunnel construction is accomplished by the method of Hand-mining, or by Mechanical means, and the use of a protective shield.

Continuous monitoring and observation of the ground surface above the tunnel is required. In some cases, it may be required to survey and record elevations along the survey grid line, several times a day, or daily.

Generally, when tunneling in good ground, tunnels with a diameter of less than eight-feet (< 8') and less than three-hundred feet to four-hundred feet (300' to 400') in length may be holed-through (excavated completely) before concreting the interior of the tunnel, when placement of pre-fabricated or pre-cast pipe is to be installed. When this is proposed, hole-through (unsupported length) before concreting of the interior of the tunnel, it shall be justified by the original subsurface geotechnical investigation and design.

Tunnel lining and bracing should consist of steel ribs and steel spreaders (dutchmen) with wood, concrete, or steel lagging, or with bolted steel liner plates.

Fireproof materials should be utilized in all construction of plant structures, above ground, within one hundred feet (100') of the shaft or tunnel. The use of flammable materials or wood shoring would require that adequate fire protection be provided.

Ventilation systems shall be established and provide a minimum of two hundred (200) cfm per worker.

- All equipment shall maintain a minimum clearance of twenty-five feet (25') from opening.
- An established contingency plan in the event of ground loss.
- Cranes utilized in operations shall maintain minimum required clearances.

TUNNEL SHIELD

- The face of the shield shall be provided with a hood or an approved grid system.
- The excavation face shall have a sufficient length to allow for the installation of one (1) complete ring of liner plates, or one (1) complete set of ribs and lagging before advancing.
- The contractor shall submit details and design information of the shield.

TUNNEL LINING

Tunnel lining and bracing should consist of steel ribs and steel spreaders with wood lagging and concrete, or steel lagging, or with bolted steel liner plates.

The tunnel liner and bracing shall be designed (calculations provided) of an adequate strength based upon the geotechnical investigation, soil analysis, loading, and the diameter and depth of cover to provide adequate support of the tunnel.

- A ring expander shall be used to expand the rib continuously outward and upward.
- Liner plates shall be designed based on joint strength, minimum stiffness, critical buckling of the liner plate wall, and deflection or flattening of the tunnel section.
- On tunnels with a diameter greater than ten feet (> 10'), the placement of ribs inside of liner plate may be required.
- When the geotechnical investigation has determined that silts and fine sands exist, that may flow under pressure, all liner plates shall include a neoprene gasket adhered to each flange face.

LAGGING

Generally started at spring line and continue upwards towards the crown. Lag spacing consists of three methods:

1. Wedging – done by driving a block of wood between the earth and the lag at each end, or by driving a wedge between the rib and the lag.
2. Stops – by welding small angles to the ribs outer flange to prevent sliding.
3. Clamps – which are applied to wood or steel lags.

If the spacing of lags between ribs is used in tunnel construction, packing between lags with filler may be required.

- Lags are boards or steel plates placed longitudinally against the roof and walls of the tunnel excavation.
- Steel lagging may consist of channel, liner plate or corrugated metal.
- Steel lagging thickness shall be designed on strength based upon the geotechnical investigation, soil analysis, and loading.
- Wood lagging thickness shall be designed on strength based upon the geotechnical investigation, soil analysis, loading. Generally wooden lags common size is three-inches by six-inches (3" x 6"), and the length is cut according to the spacing of the ribs.
- A minimum of one liner plate per ring with a two-inch (2") diameter coupling for grouting is required.

CONSTRUCTION OF SHAFTS / PITS

Shafts / pits should be constructed of a proper size and shape, and equipped as to allow work to be carried on safely.

- Shafts must be constructed of driven steel sheet pilings, steel bracing and tight wood, or steel lagging or steel liner plates and ribs.
- The removal of spoils should be accomplished by mechanical means (muck box).
- All shafts must be provided with guardrail and a toeboard.
- When ladders are utilized within the shaft or pit, cages and/or safety devices must be provided on depths of 15 feet to 20 feet, platforms must be provided at depths of greater than 20 feet.
- Ventilation systems must be established and provide a minimum of 200 cfm per worker.
- All equipment must maintain a minimum clearance of 25 feet from openings.
- Upon completion of project all shafts, pits and drifts that are not part of the finished product must be backfilled.

PLACEMENT OF SHAFTS / PITS

Shafts /Pits must be:

- Preferred to be located as far from the traveled way as feasible. At minimum, should be located 10 feet from the edge of pavement in rural areas, or at least 5 feet beyond the concrete curb and gutter or AC dike in urban areas, or at least 5 feet beyond the toe of slope of embankments.
- Located outside of access-controlled right-of-way.
- Adequately fenced or have a Type-K barrier placed around them at a 10:1 taper or as otherwise directed.

- Shored according to Cal-OSHA minimum requirements. Located within 15 feet of traffic lanes on a State highway must not extend more than 36 inches above the pavement grade unless otherwise authorized by the State representative. Reflectors must be affixed to the sides facing traffic, and placement around the perimeter of a 6-foot chain link fence during non-working hours.
- Are only allowed within access-controlled right-of-way for direct access-controlled right-of-way crossings that are excessively long or that have restricted space available outside the right-of-way.
- They must not affect State facilities or create a hazard to the traveling public. When placement is approved within access-controlled right-of-way, damaged State facilities must be replaced or repaired according to State Standard Specifications.
- Must have crushed-rock and sump areas to clear groundwater and water used to clean. They must be lined with filter fabric when groundwater is found and pumping is required.

EXCAVATION

In some locations Soil Stabilization may be required. It may become necessary at the direction of the Engineer to either pressure grout or freeze the soil area of the project to control water, to prevent loss of ground, to prevent settlement or displacement of an embankment. When required, a Registered Geotechnical Engineer shall prepare and stamp the plans determining the material and method for use.

In some projects masonry sections are installed, the amount of excavation of the tunnel should not exceed the amount needed for placement of a full masonry section after all lining is in place.

All excavated material shall be considered as unclassified material.

- In the event of any ground movement over or adjacent to construction, all work shall be suspended, except that which will assist in making the construction site secure and prevent any further additional movement of the ground.
- Excavation should not be advanced beyond the edge of the shield, except in rock.
- The geotechnical engineer/engineering geologist shall determine the allowable amount of tunnel length unsupported by bracing, based on the geotechnical investigation and design.
- All voids between the excavation and the liner shall be grouted after setting of ribs and lagging, if not expanded to full contact with the surrounding ground, as determined by the Safety Engineer.
- A log shall be maintained of all surrounding utilities and facilities.

DEWATERING

When ground water is anticipated, pumps of sufficient capacity to handle the flow shall be maintained at the site. Observation shall be maintained to detect any settlement, displacement or washing of fines into the pit, shaft or tunnel.

GROUTING

Grouting should be kept close to the heading (working front of tunnel). It may be required to add pea-gravel and fly ash to the grout. The pea-gravel would assist in consolidation and the filling of the voids, fly-ash works as a lubricant allowing the grout to free-flow.

- The use of grout stops may be utilized if necessary or if required by the Safety Engineer.
- Grouting shall be performed when ordered by the Safety Engineer.
- At no time shall progression of the tunnel exceed six feet (6') beyond the grouting of the exterior void.

- Pressure on the grouting gauge should not exceed the capacity of the lining, sufficient to fill all voids.
- A gauge shall be provided which will accurately indicate working pressure and shall be monitored constantly during grouting procedures.
- Grouting shall start at the lowest point and proceed upwards simultaneously on alternating sides.
- When grouting is complete at that location a threaded plug shall be installed into the coupling.

MATERIALS

“Notice of Materials to be used” (form CEM-3101) is required.

- The manufacturer shall provide a Certificate of Compliance, to ensure tensile and yield strengths.
- Steel lagging may consist of channel, liner plate or corrugated metal.
- Steel lagging thickness shall be designed on strength based upon the geotechnical investigation, soil analysis, and loading.
- Wood lagging thickness shall be designed on strength based upon the geotechnical investigation, soil analysis, loading. Generally wooden lags common size is three-inches by six-inches (3”x 6”), and the length is cut according to the spacing of the ribs.
- When the geotechnical investigation has determined that silts and fine sands exist, that may flow under pressure, all liner plates shall include a neoprene gasket adhered to each flange face.
- Ensure Manufacturer’s Specification Data Sheets (MSDS) are provided stipulating recommended:
 - Specifications of steel spreaders (spacing, tolerances).
 - Specifications of steel rib (section lengths, spacing, etc.)

PROJECT OWNER’S/PERMITTEE’S RESPONSIBILITIES

The project owner/permittee is responsible for providing:

A full-time Safety Engineer or Safety Representative, and proof of certification is required, either by submittal on “Certification of Structural Experience” (form TR-0133) or State Certification.

Cal/OSHA requires persons performing the duties of gas tester or safety representative to be certified by passing a written and an oral examination administered by the M&T Unit. CCR 8406(f), (h)

- Project drawings and specifications, calculations and details stamped by a Registered Structural Engineer, or a Registered Civil Engineer, with a minimum of five (5) years’ experience in sub-structural design of tunnels.
- A geotechnical investigation by a licensed geotechnical engineer to determine the following;
- Storm Water Pollution Prevention Plan (SWPPP) or Water Pollution Control Plan (WPCP).
- De-Watering Plan, if needed.
- Ground water information
- Boring and soil analysis logs, location plan of borings, cross sections, subsurface strata, fill and ground water elevations;
 - Particle size distribution (particularly percent rock and cobble),
 - Cohesion index, internal angle of friction, and soil classification,
 - Plastic and liquid limits (clays), expansion index (clays), soil density, and penetration tests,
 - Rock strength, rock joint fracture and orientation, water table levels, and soil permeability,
 - Areas of suspected and known contamination should also be noted and characterized.
- The soil investigation shall also determine the presence of rock, cobbles, and/or boulders, and the following;
 - Depth and extent of rock

- Rock type
- Rock strength
- Rock joint/fracture spacing
- Hardness
- RQD
- Estimated range of sizes & frequency of occurrence of cobbles and boulders.

CONTRACTOR’S RESPONSIBILITIES

The contractor is responsible for providing:

- Tunnel project construction plans and specifications, calculations and details, method of construction, to include the adequacy of the shield and liner material stamped by a Registered Structural Engineer, or a Registered Civil Engineer, with a minimum of five (5) years’ experience in sub-structural design of tunnels.
- “Notice of Materials to be used” (form CEM-3101).
- Method of construction plan.
- A Licensed Surveyor.
- Proof of rib expanders and/or liner supports.
- Working schedule of the project.
- Contingency plan for dealing with ground loss work.
- Shaft; soil stability at portals and ground improvement plan.
- Dewatering plans for entry and exit shafts/pits, if needed.
- Installation and monitoring of SWPPP or WPCP facilities and conditions.
- Shoring design for entry and exit shafts/pits.
- Survey control plan: lasers, laser mounting, laser checking.
- Ground surface settlement monuments and subsurface settlement monuments monitoring program plan.
 - Buried points

ENCASEMENT REQUIREMENTS

1. Encasement requirements are discussed in Section 603.3C of the Encroachment Permits Manual.
2. The minimum wall thickness required for steel encasements is shown in Table 6.8 of the Encroachment Permits Manual.
3. Encasement ends shall be plugged with ungrouted bricks or other suitable material approved by the Caltrans' representative.
4. The Caltrans' representative may require the permittee to pressure grout, filling any voids generated during the permitted work. Grouting shall be at the expense of the permittee. Grout holes when placed inside the of the pipe, generally on diameters of 36" or greater, shall be on 8' centers, longitudinally and offset 22 degrees from vertical, and staggered to the left and right of the top longitudinal axis of the pipe. Grout pressure shall not exceed five-(5) psig (34.5 kPa) for a duration sufficient to fill all voids.
5. There is a spacing requirement when placement of multiple encasements is requested. The distance between multiple encasements shall be the greater of either 24" or twice that of the diameter of the larger pipe being installed.
6. Wing cutters when used shall only add a maximum of 1" in diameter to the outside diameter of the encasement pipe. Voids in excess of the Standard Specifications shall be grouted.
7. A band welded to the leading edge of the encasement pipe should be placed square to the alignment and not on the bottom edge of pipe. A flared lead section on bores over 100' shall not be permitted.
8. The length of the auger strand shall be equal to that of the section of encasement pipe.

BORE & JACK

Utility installations placed by Bore & Jack shall be monitored to ensure that the integrity of the existing roadway elevations are maintained. When the encasement is also to serve as the carrier facility for hazardous materials, the use of another trenchless installation is recommended. Potential damage could occur during the jacking process, rendering the use of that facility as the carrier.

BORE AND RECEIVING PITS

Requirements:

1. Must be located as far from the traveled way as feasible. At minimum, must be located 10 feet from the edge of pavement in rural areas, or at least 5 feet beyond the concrete curb and gutter or AC dike in urban areas, or at least 5 feet beyond the toe of slope of embankments.
2. Must be located outside of access-controlled right-of-way. Any deviations for direct crossings that are excessively long, or there is restricted space available for placement, outside of the right-of-way require an approved encroachment policy exception. Those portions of the installation not placed by Bore & Jack must be encased by the open trench method.
3. Must be protected by placement of 6-foot chain link fence or Type-K barrier around them.
4. Must be shored in accordance to Cal-OSHA requirements. Shoring of pits located within 15 feet of lanes within State highway right-of-way must not extend more than 36 inches in height above the pavement grade, unless authorized by a Caltrans' representative.
5. Reflectors must be affixed to the shoring on all sides facing traffic.
6. Pits must not affect any State facilities, or create a hazard to the traveling public. Damaged State facilities must be replaced in-kind or repaired to their original state.
7. All pits should have crushed-rock and sump areas to clear groundwater and water used to clean the casings. Pits must be lined with filter fabric when groundwater is found and pumping is required.
8. Temporary Type-K railing must be placed at a 10:1 taper or as otherwise directed by the Caltrans' representative to maintain the integrity of the adjacent travel lane.

Any installation that is 30 inches in diameter or greater is defined as tunnel. See Section 518, and Table 5.29 - Permit Code TN for the requirements of such installations.

RECOMMENDED MINIMUM DEPTH OF COVER FOR HDD INSTALLATIONS

DIAMETER	DEPTH OF COVER
2 inches to 6 inches	4 feet
8 inches to 14 inches	6 feet
15 inches to 24 inches	10 feet
25 inches to 48 inches	15 feet

Upon completion of the work, the permittee shall provide an accurate as-built drawing of the installed pipe.

SOIL INVESTIGATIONS

The District Permit Engineer (DPE) should determine the extensiveness of the Soil Investigation to be performed based on the complexity of the HDD operation, or modify the guideline to fit the respective area.

A soil investigation is required, suitable for the proposed complexity of the installation to confirm ground conditions that will be encountered during the HDD operation. The HDD process is a continual and extensive soil analysis as the pilot bore is made encountering the varying soils and formations.

Projects less than 500' in length, where the product or casing is 8" or less in diameter:

A field soil sampling investigation to a depth of one foot below the proposed drilling.

- a) Subsurface strata, fill, debris and material

Projects less than 800' in length, where the product or casing is 14" or less in diameter:

A field soil sampling investigation to a depth of one foot below the proposed drilling.

- a) subsurface strata, fill, debris and material
- b) particle size distribution (particularly percent gravel and cobble)

Projects where the product or casing is 16" or greater in diameter:

A geotechnical evaluation by a qualified soil engineer to determine the following.

- a) subsurface strata, fill, debris and material,
- b) particle size distribution (particularly percent gravel and cobble),
- c) cohesion index, internal angle of friction, and soil classification,
- d) plastic and liquid limits (clays), expansion index (clays), soil density
- e) water table levels, and soil permeability,

Projects where the product or casing 24" or greater in diameter:

A geotechnical evaluation by a qualified soil engineer to determine the following.

- a) subsurface strata, fill, debris and material
- b) particle size distribution (particularly percent gravel and cobble)
- c) cohesion index, internal angle of friction, and soil classification
- d) plastic and liquid limits (clays), expansion index (clays), soil density, and penetration tests,
- e) rock strength, rock joint fracture and orientation, water table levels, and soil permeability,
- f) areas of suspected and known contamination should also be noted and characterized.

A borehole or test pit should be undertaken on both sides and in the median when conditions permit.

Additional boreholes or test pits should be considered if substantial variations in soil conditions are encountered in the soil analysis (the presence of gravel, cobble, and/or boulders).

Fluid jetting methods used as a means of cutting **should only be considered** where soils have a high cohesion such as stiff clays.

PRE-CONSTRUCTION & SITE EVALUATION

The following steps should be undertaken by the permittee/contractor to ensure safe and efficient construction with minimum interruption of normal, everyday activities at the site.

- Notify owners of subsurface utilities along and on either side of the proposed drill path of the impending work through USA alert (the one-call program). All utilities along and on either side of the proposed drill path are to be located.
- Obtain all necessary permits or authorizations to carry construction activities near or across all such buried obstructions.
- All utility crossings should be exposed using a hydro-excavation, hand excavation (potholing) or other approved method to confirm depth.
- Construction schedule should be arranged to minimize disruption (e.g. drilling under railroad beds, major highways, and/or river crossings).
- The proposed drill path should be determined and documented, including its horizontal and vertical alignments and the location of buried utilities and substructures along the path.

Walk the area prior to the commencement of the project and visually inspect potential sites. The following should be addressed:

- When on State R/W establish whether or not there is sufficient room at the site for: entrance and exit pits; HDD equipment and its safe unimpeded operation; support vehicles; fusion machines; stringing out the pipe to be pulled back in a single continuous operation.
- Establishing suitability of soil conditions for HDD operations. Subgrade soils consisting of large grain materials like gravel, cobble, and boulders make HDD difficult to use and may contribute to pipe damage.
- Check the site for evidence of substructures such as manhole covers, valve box covers, meter boxes, electrical transformers, conduits or drop lines from utility poles, and pavement patches. HDD may be a suitable method in areas where the substructure density is relatively high.

INSTALLATION REQUIREMENTS

During construction continuous monitoring and plotting of pilot drill progress shall be undertaken to ensure compliance with the proposed installation alignment and allow for appropriate course corrections to be undertaken that would minimize “dog legs” should the bore start to deviate from the intended bore path.

Monitoring shall be accomplished by manual plotting based on location and depth readings provided by the locating/tracking system or by computer generated bore logs which map the bore path based on information provided by the locating/tracking system. Readings or plot points shall be undertaken on every drill rod.

Excess drilling fluids shall be contained at entry and exit points until recycled or removed from the site. Entry and exit pits should be of sufficient size to contain the expected return of drilling fluids and soil cuttings.

The permittee shall ensure that all drilling fluids are disposed of in a manner acceptable to the appropriate

local, state, or federal regulatory agencies. When drilling in contaminated ground the drilling fluid shall be tested for contamination and disposed of appropriately. Restoration of damage to any highway or non-highway facility caused by escaping (“fracout”) drilling fluid, or the directional drilling operation, shall be the responsibility of the permittee.

To minimize heaving during pullback, the pull back rate shall be determined which maximizes the removal of soil cuttings and minimizes compaction of the ground surrounding the borehole. The pullback rate shall also minimize overcutting of the borehole during the back reaming operation to ensure excessive voids are not created resulting in post installation settlement.

The permittee shall, prior to and upon completion of the directional drill, establish a Survey Grid Line and provide monitoring as outlined in their submitted detailed monitoring plan. Subsurface monitoring points shall be utilized to provide early indications of settlement as large voids may not materialize during drilling due to pavement bridging.

Should pavement heaving or settlement occur, sawcutting and replacement of the asphalt shall be the responsibility of the permittee.

To prevent future settlement should the drilling operation be unsuccessful the permittee shall ensure the backfill of any void(s) with grout or backfilled by other means.

PERMITTEE’S/CONTRACTOR’S RESPONSIBILITIES

The plans set submittal should contain the following information in support of the permit application.

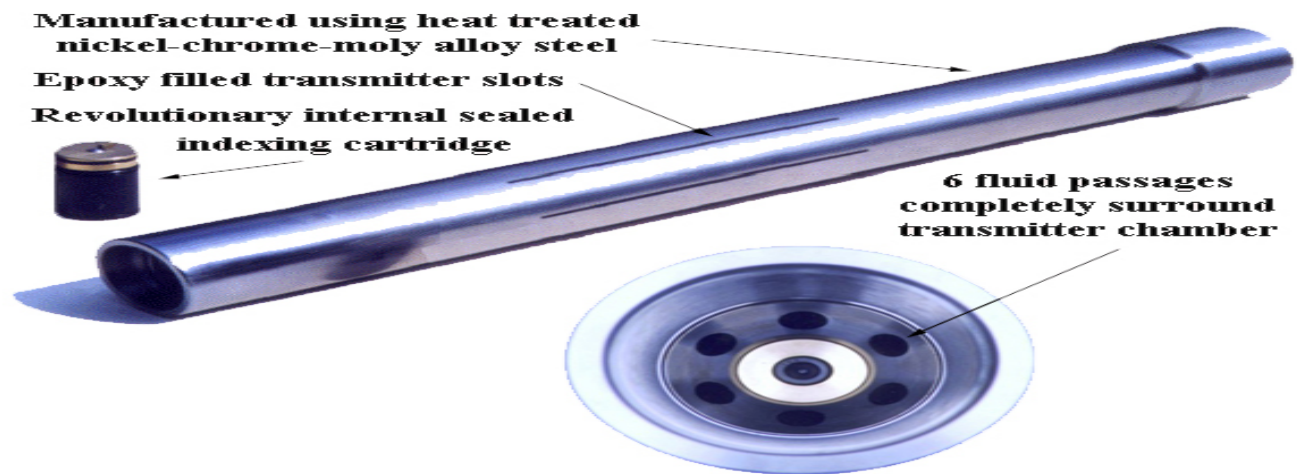
1. Location of entry and exit point.
2. Equipment and pipe layout areas.
3. Proposed drill path alignment (both plan & profile view).
4. Location, elevations and proposed clearances of all utility crossings and structures.
5. Proposed Depth of cover.
6. **Soil analysis.
7. Product material (HDPE/steel), length, diameter-wall thickness, reamer diameter.
8. Detailed pipe calculations, confirming ability of product pipe to withstand installation loads and long term operational loads including H20.
9. Proposed composition of drilling fluid (based on soil analysis) viscosity and density.
10. Drilling fluid pumping capacity, pressures and flow rates proposed.
11. State right-of-way lines, property, and other utility right-of-way or easement lines.
12. Elevations.
13. Type of tracking method/system.
14. Survey Grid establishment for monitoring ground surface movement (settlement or heave) due to the drilling operation.

Note: ** *May be waived by the District Permit Engineer on HDD jobs of less than 6" in diameter and on a transverse crossing less than 150' in length.*

ADDITIONAL PERMIT CONDITIONS SHALL BE SET FORTH IN THE SPECIAL PROVISIONS OF THE PERMIT. LOCATING AND TRACKING

EFFECTIVE JANUARY 1, 2000, LOCATING AND TRACKING OF THE REAMER DURING THE BACK-REAMING PROCESS IS REQUIRED.

The illustration below shows a universal housing that will work with any drill-string on all HDD rigs.



DRILLING FLUIDS MANAGEMENT PLAN

The following information should be provided as part of the drilling fluid management plan:

- Identify source of fresh water for mixing the drilling mud (Necessary approvals and permits are required for sources such as streams, rivers, ponds, or fire hydrants).
- Method of slurry containment.
- Method of recycling drilling fluid and spoils (if applicable).
- Method of transporting drilling fluids and spoils off site.

Drilling fluid pressures should not exceed that which can be supported by the overburden (soil) pressure.

Drilling fluids serve many functions, as follows:

- Removes cuttings from the bottom of the hole and transports them to the surface.
- Holds cuttings and weight material in suspension when circulation is interrupted.
- Releases sands and cuttings at the surface.
- Stabilizes the hole with an impermeable cake.
- Cools and lubricates the drill bit and drill string
- Controls subsurface pressures.
- Transmits hydraulic horsepower.
- Cools the locating transmitter sonde preventing burnout.

PREVIOUS EXPERIENCE

- The permittee's contractor should provide a list of projects completed by his company, location, project environment (e.g., urban work, river crossing), product diameter and length of installation.
- The permittee's contractor should provide a list of key personnel.

SAFETY

- Emergency procedures for inadvertently boring into a natural gas line, live power cable, water main, sewer lines, or a fiber-optic cable, which comply with applicable regulations.
- Emergency evacuation plan in case of an injury.

CONTINGENCY PLANS

The Contingency plan shall address the containment and removal, of an inadvertent return or spill (e.g., drilling fluids, and hydraulic fluids).

COMMUNICATION PLAN

The communication plan should address the following:

- The phone numbers for communication with owner or his representative on the site.
- Identification of all key personnel which will be responsible for ensuring that the communications plan is followed.

DRILLING OPERATIONS

The following paragraphs provide general remarks and rules of thumb related to the directional boring method, as well as specific details regarding various stages of the installation process.

- The drill path alignment should be as straight as possible to minimize the fractional resistance during pullback and maximize the length of the pipe that can be installed during a single pull.
- The radius of curvature is determined by the bending characteristics of the product line, and it is increasing with diameter.
- If a drill hole beneath a road must be abandoned, the hole should be backfilled with grout or bentonite to prevent future subsidence.

EQUIPMENT SETUP AND SITE LAYOUT

- Sufficient space is required on the rig side to safely set up and operate the equipment.
- Sufficient space should be allocated to fabricate the product pipeline into one string, thus enabling the pull back to be conducted in a single continuous operation.

DRILLING AND BACK-REAMING

- Drilling mud shall be used during drilling and back reaming operations. Using exclusively water may cause collapse of the borehole in unconsolidated soils, while in clays, the use of water may cause swelling and subsequent jamming of the product.
- Heaving may occur when attempting to back ream too large of a hole. This can be avoided by using several pre-reams to gradually enlarge the hole to the desired diameter.
- The conduit must be sealed at both ends with a cap or a plug to prevent water, drilling fluids and other foreign materials from entering the pipe as it is being pulled back.
- Pipe rollers, skates or other protective devices should be used to prevent damage to the pipe from the edges of the pit during pullback, eliminate ground drag or reduce pulling force and subsequently reduce the stress on the product.
- The drilling mud in the annular region should not be removed after installation, but permitted to solidify and provide support for the pipe and neighboring soil.

BREAK-AWAY PULLING HEAD

Some utility companies require the use of breakaway swivels to limit the amount of force used when pulling HDPE products.

PROTECTIVE COATINGS

In an HDD installation, the product pipe may be exposed to extra abrasion during pullback. When installing a steel pipe, a form of coating which provides a corrosion barrier as well as an abrasion barrier is recommended during the operation, the coating should be well bonded and have a hard smooth surface to resist soil stresses and reduce friction, respectively. A recommended type of coating for steel pipes is mill applied Fusion Bonded Epoxy.

DRILLING FLUID - COLLECTION AND DISPOSAL PRACTICES

Drilling fluids, additives and their Material Safety Data Sheets (MSDS) shall be identified within the contractor's submittal permit package.

- Excess drilling fluids shall be contained within a lined pit or containment pound, until removed from the site.
- When an area of contaminated ground is encountered, the slurry shall be tested for contamination and disposed of in a manner, which meets Local, State and/or Federal requirements.
- Precautions shall be taken to keep drilling fluids out of the streets, manholes, sanitary and storm sewers, and other drainage systems, including streams and rivers.
- The contractor shall make all diligent efforts to minimize the amount of drilling fluids and cuttings spilled during the drilling operation, and shall provide complete clean-up of all drilling mud overflows or spills.

SITE RESTORATION AND POST CONSTRUCTION EVALUATION

All surfaces affected by the work shall be restored to their pre-existing conditions.

The permittee/contractor shall provide a set of as-built drawings to include both alignment and profile.

Drawings should be constructed from actual field readings. Raw data shall be submitted as part of the "As-Built" document. The contractor shall stipulate the tracking method used to ensure the data was captured.

MICRO-TUNNELING

Micro-tunneling is a hybrid of the tunneling industry (miniaturization of tunnel boring machines) and the pipeline industry where pipe jacking has been used for more than 100 years. It is a special construction method suitable for many conditions where open cut construction methods are not cost effective, too disruptive, or not physically possible.

MICRO-TUNNELING PLAN SET SUBMITTAL

The plan set submittal shall consist of two separate submittals, by the Owner of the installation and by the owner's contractor.

The submittal by the owning agency shall contain the following plans and information:

1. Drive lengths
2. Proposed depth
3. Shaft; jacking and receiving shafts, manhole construction, shaft backfill, and shoring removal;
 - Type of shaft;
 - a) Sheet Pile
 - b) Beams and Lagging
 - c) Trench Box
 - d) Auger Drilled and Lined
 - e) Caissons
4. Intermediate jacking stations;
 - Number of Stations;
 - a) Required by Specifications
 - b) On site
5. Geotechnical; including ground water information
 - Geotechnical evaluation by a qualified soil engineer to determine the following;
 - a) Boring logs & plan locations of borings and cross sections, Subsurface strata, fill and ground water elevations
 - b) Particle size distribution (particularly percent rock and cobble),
 - c) Cohesion indexes, internal angle of friction, and soil classification,
 - d) Plastic and liquid limits (clays), expansion index (clays), soil density, and penetration tests,
 - e) Rock strength; rock joint fracture and orientation, water table levels, and soil permeability,
 - e) Areas of suspected and known contamination should also be noted and characterized.
 - Should the soil investigation determine the presence of rock, cobbles, and/or boulders, determination of the following information would be required;
 - a) Depth and extent of rock
 - b) Rock type
 - c) Rock strength
 - d) Rock joint/fracture spacing
 - e) Hardness
 - f) RQD
 - g) Estimated range of sizes & frequency of occurrence of cobbles and boulders.

Boreholes or test pits for road crossings shall be undertaken on both sides with one or more additional boreholes or test pits in the median where conditions permit. Additional boreholes or test pits should be considered if substantial variation in soil conditions are encountered. Where a proposed installation parallels an existing road, boreholes or test pits should be undertaken at approximately 250 to 410 feet intervals.

CONTRACTOR'S SUBMITTAL

Shall contain the following plans and information:

1. Shaft; soil stability at portals and ground improvement.
2. Dewatering plans for jacking and receiving shafts, if any.
3. Shoring design for jacking and receiving shafts.
4. Survey control plan: lasers, laser mounting, laser checking.
5. Ground surface settlement monuments and subsurface settlement monuments monitoring program plan.
 - Buried points
 - a) Rebar points, or
 - b) MPBX (Multi-point borehole extensometers)
6. Recycling information; slurry mix and polymer additives, slurry separation plant type, and spoils disposal;
 - a) Removal of slurry in dump trucks.
 - b) Removal of slurry in tankers.
 - c) Settlement ponds.
 - d) Muck piles on site.
7. Contingency plan information;
 - a) Ground improvement plans when required at portals and/or behind thrust block/reaction wall due to weak and unstable soil conditions.
 - b) Obstruction removal through emergency (911) shafts or other means.
 - c) Mechanical breakdowns and recovery of the MTBM through 911 shafts or other means.
 - d) Control of hydrofracture and slurry loss.
 - e) Remediation of loss of ground and excessive ground surface settlement.

PIPE RAMMING

Pipe Ramming pit requirements are identical to those for Bore & Jack.

Establishment of a survey-grid line is required.

Before any project begins, exploration bore-holes and a complete geotechnical investigation shall be conducted to determine possible difficulties to determine the drilling trajectory.

The casing shall be rammed open ended, except when the diameter is 6" or smaller. Pipes 6" or smaller may be rammed open ended or closed.

A soil shoe may be installed on the leading edge of the casing, either by fabrication on site or obtained from the manufacturer. A soil shoe shall not be utilized on those installations at depths or 18" or less from the surface.

Lubrication shall only be utilized to reduce friction and increase production. The amount of lubrication directed to the outside of the pipe shall only be of a sufficient amount required to fill the void between the outside of the pipe and soil, as created by the soil shoe.

Lubrication to the inside of the casing shall only be an amount adequate to assist in spoil removal when the ram is completed.

Welding of the casing at joints shall be as per the manufacturer's recommendations.

The use of straps at each joint on pipe diameters of 12" or larger is required as is the use of the manufacturer's specified welding wire or rod.

Spoil removal for rammed encasements of 30" in diameter or less, may utilize pressurized air or water.

Air pressure shall not exceed 150 psi and water pressure shall not exceed 300 psi.

Encasements larger than 30" in diameter shall have the spoils removed by other means than by pressurizing of the pipe, such as, manual, auguring, vacuum, washing or other means.

The Receiving Pit shall be steel plated entirely when the spoils are to be removed from within the encasement by means of air or water pressurized methods.

PIPE BURSTING

Pipe Bursting operations generally are only performed by the owning utility when they have exceeded the operating capacity of their existing facilities. In most cases pipe bursting allows the utility owners the advantage of upgrading their existing facilities by up to 50%.

On installations of diameters 12” or greater it is necessary to establish a survey-grid line and establish the existing elevation points over the existing area of installation.

A soil analysis should be required and review of the information to identify any locations of difficulty, density, water table, changes in soil formation that could present or create greater friction resistance.

Request information of the proposed project as to:

1. The ratio of the proposed upgrade to determine difficulty, generally up to 25% increase in diameter is common. An increase of 25% - 50% is considered challenging, and an increase of 50% or greater is considered experimental.
2. The existing depth of cover, “rule of thumb” depth of cover should be at least 10X the difference in the upgrade of the existing diameter to be burst.
3. Whether or not the existing line has been viewed by video, do not allow line to be burst blind.
4. Is this proposed line straight or are there bends in the line.
5. If bends are existing in the line, the location of the bend will have to be excavated and new pits re-established at those locations.
6. Require that the contractor provide a list of equipment to be on site to handle an emergency, in the event that bypass pumping is required to maintain the existing service in the event of a problem.
7. As to what method will be utilized (static, pneumatic, burst and jack, or hydraulic).

Caltrans' Signal Operations permitting requirements in addition of traffic control notes:

1- Sheet C-18, following requirements apply

- a) The limit line detection uses Video system but there are 3 existing Advance loops 225' from the limit line.
- b) Construction Note 4 should read as: For loop & Conduit relocation work should be coordinated with Caltrans.
- c) The speed limit on Lake Murray Blvd is 35 MPH. The new loops should be placed at 185' from the limit line to meet the standard.

2- Existing electrical components need to be protected in place. (Provision to be placed in permit.)

3- We recommend hiring a 3rd party to locate the underground electrical equipment before start of trenching. (*Provision to be placed in permit.*)

4- Damaged electrical components need to be replaced prior to completion of project, and in some cases sooner. (*Provision to be placed in permit.*)

5- Contact Caltrans Electrical Maintenance 72 hours prior to start of work. John Koenig 619-572-8534 (*Provision to be placed in permit.*)

APPENDIX K
HAZARDOUS WASTE LABEL AND FORMS

HAZARDOUS WASTE

**STATE AND FEDERAL LAW PROHIBITS IMPROPER DISPOSAL
IF FOUND, CONTACT THE NEAREST POLICE, OR PUBLIC SAFETY
AUTHORITY, OR THE U.S. ENVIRONMENTAL PROTECTION AGENCY
OR THE CALIFORNIA DEPARTMENT OF HEALTH SERVICES**

GENERATOR NAME _____

ADDRESS _____ 24 HR. PHONE () _____

CITY _____ STATE _____ ZIP _____

EPA ID NO. _____ MANIFEST DOCUMENT NO. _____

EPA WASTE NO. _____ CA WASTE NO. _____ ACCUMULATION START DATE _____ / /

CONTENTS, COMPOSITION _____

PROPER DOT SHIPPING NAME _____

TECHNICAL NAME (S) _____

UN/NA NO. WITH PREFIX _____

PHYSICAL STATE HAZARDOUS PROPERTIES FLAMMABLE TOXIC
 SOLID LIQUID CORROSIVE REACTIVE OTHER _____

HANDLE WITH CARE!

CONTAINS HAZARDOUS OR TOXIC WASTES

INCIDENT/RELEASE ASSESSMENT FORM ¹

If you have an emergency, Call 911

Handlers of hazardous materials are required to report releases. The following is a tool to be used for assessing if a release is reportable. Additionally, a non-reportable release incident form is provided to document why a release is not reported (see back).

Questions for Incident Assessment:

	YES	NO
1. Was anyone killed or injured, or did they require medical care or admitted to a hospital for observation?	<input type="checkbox"/>	<input type="checkbox"/>
2. Did anyone, other than employees in the immediate area of the release, evacuate?	<input type="checkbox"/>	<input type="checkbox"/>
3. Did the release cause off-site damage to public or private property?	<input type="checkbox"/>	<input type="checkbox"/>
4. Is the release greater than or equal to a reportable quantity (RQ)?	<input type="checkbox"/>	<input type="checkbox"/>
5. Was there an uncontrolled or unpermitted release to the air?	<input type="checkbox"/>	<input type="checkbox"/>
6. Did an uncontrolled or unpermitted release escape secondary containment, or extend into any sewers, storm water conveyance systems, utility vaults and conduits, wetlands, waterways, public roads, or off site?	<input type="checkbox"/>	<input type="checkbox"/>
7. Will control, containment, decontamination, and/or clean up require the assistance of federal, state, county, or municipal response elements?	<input type="checkbox"/>	<input type="checkbox"/>
8. Was the release or threatened release involving an unknown material or contains an unknown hazardous constituent?	<input type="checkbox"/>	<input type="checkbox"/>
9. Is the incident a threatened release (a condition creating a substantial probability of harm that requires immediate action to prevent, reduce, or mitigate damages to persons, property, or the environment)?	<input type="checkbox"/>	<input type="checkbox"/>
10. Is there an increased potential for secondary effects including fire, explosion, line rupture, equipment failure, or other outcomes that may endanger or cause exposure to employees, the general public, or the environment?	<input type="checkbox"/>	<input type="checkbox"/>

If the answer is YES to any of the above questions – report the release to the California Office of Emergency Services at 800-852-7550 and the local CUPA daytime: (619) 338-2284, after hours: (858) 565-5255. Note: other state and federal agencies may require notification depending on the circumstances.

Call 911 in an emergency

If all answers are NO, complete a Non Reportable Release Incident Form (page 2 of 2) and keep readily available. Documenting why a “no” response was made to each question will serve useful in the event questions are asked in the future, and to justify not reporting to an outside regulatory agency.

If in doubt, report the release.

¹ This document is a guide for accessing when hazardous materials release reporting is required by Chapter 6.95 of the California Health and Safety Code. It does not replace good judgment, Chapter 6.95, or other state or federal release reporting requirements.

NON REPORTABLE RELEASE INCIDENT FORM

1. RELEASE AND RESPONSE DESCRIPTION

Incident # _____

Date/Time Discovered	Date/Time Discharge	Discharge Stopped <input type="checkbox"/> Yes <input type="checkbox"/> No
Incident Date / Time:		
Incident Business / Site Name:		
Incident Address:		
Other Locators (Bldg, Room, Oil Field, Lease, Well #, GIS)		
Please describe the incident and indicate specific causes and area affected. Photos Attached?: <input type="checkbox"/> Yes <input type="checkbox"/> No		
Indicate actions to be taken to prevent similar releases from occurring in the future.		

2. ADMINISTRATIVE INFORMATION

Supervisor in charge at time of incident:	Phone:
Contact Person:	Phone:

3. CHEMICAL INFORMATION

Chemical	Quantity <input type="checkbox"/> GAL <input type="checkbox"/> LBS <input type="checkbox"/> FT ³
Chemical	Quantity <input type="checkbox"/> GAL <input type="checkbox"/> LBS <input type="checkbox"/> FT ³
Chemical	Quantity <input type="checkbox"/> GAL <input type="checkbox"/> LBS <input type="checkbox"/> FT ³
Clean-Up Procedures & Timeline:	
Completed By:	Phone:
Print Name:	Title:

EMERGENCY RELEASE FOLLOW - UP NOTICE REPORTING FORM

A	BUSINESS NAME	FACILITY EMERGENCY CONTACT & PHONE NUMBER () -
B	INCIDENT DATE: MO DAY YR TIME OES NOTIFIED (use 24 hr time)	OES CONTROL NO.
C	INCIDENT ADDRESS LOCATION	CITY / COMMUNITY COUNTY ZIP
D	CHEMICAL OR TRADE NAME (print or type)	CAS Number
D	CHECK IF CHEMICAL IS LISTED IN 40 CFR 355, APPENDIX A <input type="checkbox"/>	CHECK IF RELEASE REQUIRES NOTIFICATION UNDER 42 U.S.C. Section 9603 (a) <input type="checkbox"/>
D	PHYSICAL STATE CONTAINED: <input type="checkbox"/> SOLID <input type="checkbox"/> LIQUID <input type="checkbox"/> GAS	PHYSICAL STATE RELEASED: <input type="checkbox"/> SOLID <input type="checkbox"/> LIQUID <input type="checkbox"/> GAS
D	ENVIRONMENTAL CONTAMINATION: <input type="checkbox"/> AIR <input type="checkbox"/> WATER <input type="checkbox"/> GROUND <input type="checkbox"/> OTHER	QUANTITY RELEASED TIME OF RELEASE DURATION OF RELEASE _____ DAYS _____ HOURS _____ MINUTES
E	ACTIONS TAKEN	
F	KNOWN OR ANTICIPATED HEALTH EFFECTS (Use the comments section for addition information) <input type="checkbox"/> ACUTE OR IMMEDIATE (explain) _____ <input type="checkbox"/> CHRONIC OR DELAYED (explain) _____ <input type="checkbox"/> NOTKNOWN (explain) _____	
G	ADVICE REGARDING MEDICAL ATTENTION NECESSARY FOR EXPOSED INDIVIDUALS	
H	COMMENTS (INDICATE SECTION (A - G) AND ITEM WITH COMMENTS OR ADDITIONAL INFORMATION)	
I	CERTIFICATION: I certify under penalty of law that I have personally examined and I am familiar with the information submitted and believe the submitted information is true, accurate, and complete. REPORTING FACILITY REPRESENTATIVE (print or type) _____ SIGNATURE OF REPORTING FACILITY REPRESENTATIVE _____ DATE: _____	

EMERGENCY RELEASE FOLLOW-UP NOTICE REPORTING FORM INSTRUCTIONS

GENERAL INFORMATION:

Chapter 6.95 of Division 20 of the California Health and Safety Code requires that written emergency release follow-up notices prepared pursuant to 42 U.S.C. § 11004, be submitted using this reporting form. Non-permitted releases of reportable quantities of Extremely Hazardous Substances (listed in 40 CFR 355, appendix A) or of chemicals that require release reporting under section 103(a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 [42 U.S.C. § 9603(a)] must be reported on the form, as soon as practicable, but no later than 30 days, following a release. The written follow-up report is required in addition to the verbal notification.

BASIC INSTRUCTIONS:

- The form, when filled out, reports follow-up information required by 42 U.S.C § 11004. Ensure that all information requested by the form is provided as completely as possible.
- If the incident involves reportable releases of more than one chemical, prepare one report form for each chemical released.
- If the incident involves a series of separate releases of chemical(s) at different times, the releases should be reported on separate reporting forms.

SPECIFIC INSTRUCTIONS:

Block A: Enter the name of the business and the name and phone number of a contact person who can provide detailed facility information concerning the release.

Block B: Enter the date of the incident and the time that verbal notification was made to OES. The OES control number is provided to the caller by OES at the time verbal notification is made. Enter this control number in the space provided.

Block C: Provide information pertaining to the location where the release occurred. Include the street address, the city or community, the county and the zip code.

Block D: Provide information concerning the specific chemical that was released. Include the chemical or trade name and the Chemical Abstract Service (CAS) number. Check all categories that apply. Provide best available information on quantity, time and duration of the release.

Block E: Indicate all actions taken to respond to and contain the release as specified in 42 U.S.C. § 11004(c).

Block F: Check the categories that apply to the health effects that occurred or could result from the release. Provide an explanation or description of the effects in the space provided. Use Block H for additional comments/information if necessary to meet requirements specified in 42 U.S.C. § 11004(c).

Block G: Include information on the type of medical attention required for exposure to the chemical released. Indicate when and how this information was made available to individuals exposed and to medical personnel, if appropriate for the incident, as specified in 42 U.S.C. § 11004(c).

Block H: List any additional pertinent information.

Block I: Print or type the name of the facility representative submitting the report. Include the official signature and the date that the form was prepared.

MAIL THE COMPLETED REPORT TO:

**State Emergency Response Commission (SERC)
Attn: Section 304 Reports
Hazardous Materials Unit
3650 Schriever Avenue
Mather, CA 95655**

NOTE: Authority cited: Sections 25503, 25503.1 and 25507.1, Health and Safety Code. Reference: Sections 25503(b)(4), 25503.1, 25507.1, 25518 and 25520, Health and Safety Code.

APPENDIX L
LONG-TERM MAINTENANCE AND MONITORING AGREEMENT

LONG-TERM MAINTENANCE AND MONITORING AGREEMENT

This **25-Month Long-Term Maintenance and Monitoring Agreement (LTMMA)** is made and entered into by and between the City of San Diego (City), a municipal corporation, and INSERT NAME OF CONTRACTOR - TO BE IDENTIFIED AFTER AWARD (Contractor), who may be individually or collectively referred to herein as a "Party" or the "Parties."

RECITALS

- A. Concurrent with execution of this LTMMA, the Parties entered into a general contract (Construction Contract) for the construction of **Montezuma PPL/Mid-City Pipeline Ph2 and 70th-Alvarado to Saranac-Sidewalk, WBS number S-11026 and B-17065, Bid No. K-19-1821-DBB-3.**
- B. In accordance with the Construction Contract, the Contractor shall enter into this LTMMA with the City for the purpose of implementing and fulfilling long-term maintenance requirements in accordance with the City of San Diego Municipal Code and the Contract Documents for the specified elopement(s) of **Montezuma PPL/Mid-City Pipeline Ph 2 and 70th-Alvarado to Saranac-Sidewalk** (Maintenance Requirements).
- C. The Contractor is ready and willing to fulfill its maintenance requirements in accordance with the terms of this LTMMA.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants and conditions set forth herein, and for good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties hereby set forth their mutual covenants and understandings as follows:

INTRODUCTORY PROVISIONS

- A. **Recitals Incorporated.** The above referenced Recitals are true and correct and are incorporated into this LTMMA by this reference.
- B. **Exhibits Incorporated.** All Exhibits and Attachments referenced in this LTMMA are incorporated into this LTMMA by this reference.
- C. **Contract Term.** This LTMMA shall be effective upon completion of the Plant Establishment Period (PEP) as described in **Section 6-1.1** of Attachment E and **Section 802** of the Construction Contract and it shall be effective until the completion of the Work as described below.
- D. **Terms and Conditions.** This LTMMA is subject to the terms and conditions of the Construction Contract included in the GREENBOOK, WHITEBOOK, and Special Provisions (**Part 0, Part 1, and Part 8**) except as otherwise stated in this LTMMA.

E. Partial Release of Payment Bond and Performance Bond.

- 1. Performance of Contract in Two Phases.** There are two separate phases of Work to be performed by the Contractor under this Contract. The first phase covers the Work involved in the original agreement as described in this agreement (“Phase 1 Work”). The second phase covers the work involved in the long-term maintenance of the Re-vegetation/Restoration Area after Phase 1 Work has been completed (“Phase 2 Work”).
- 2. Bond Handling for Contract Phases.** The Payment Bond and the Performance Bond covering Phase 1 Work on this Contract shall remain in full force and effort until completion of that phase is certified. The original Payment Bond and the original Performance Bond covering Phase 1 Work on this Contract shall continue in full force and effort for Phase 2 Work, however the value of each bond may be reduced as follows:

 - 2.1** Completion by the Contractor of all Phase 1 Work shall be evidenced solely by the City Engineer affirming in writing that to the best of their knowledge that all Phase 1 Work has been completed by the Contractor in strict conformity with all City-approved plans and revisions, and that the Phase 1 Work completed by the Contractor meets all applicable standards (“Notice of Completion”).
 - 2.2** Upon issuance by the City Engineer of the Notice of Completion for Phase 1 Work, the Payment Bond for this Project, and the Performance Bond for this Project, may be partially released, and thereby reduced for the Work performed under Phase 1. The remaining payment and performance bond will cover the full cost of Phase 2 Work on this Project, which will be the amount specified in Section 4.1 of this LTMMA.
- 3. No Partial Release Upon Default.** No Partial Performance Bond Release and Reduction shall be given to the Contractor if the Performance Bond and/or this Agreement is in default on Phase 1 Work.

SECTION 1 - MAINTENANCE CONTRACT SUMMARY

- 1.1. General.** The Contractor shall fulfill the Project's Maintenance Requirements (Work) as identified in the scope of work attached as **Exhibit A** in a manner satisfactory to the City.

The Contractor shall provide all equipment, labor, and materials necessary to perform the **Work** as described in **Exhibit A**, at the direction of the City.

- 1.2. Schedule of Work.** The Contractor shall follow the Schedule of Work (Schedule) for the maintenance and monitoring period provided in the Plans.

After receiving notification from the City, the Contractor shall create a comprehensive Schedule of Work (Schedule) for performance of this LTMMA for the City's approval. The Schedule shall include routine work, inspection, and infrequent operations such as repairs, fertilization, aerification, watering, and pruning.

The City will approve the Schedule prior to the commencement of the Work. The City may require the Contractor to revise the Schedule. The Contractor shall not revise the Schedule unless the revisions have received the prior written approval of the City.

- 1.3. Commencement of Work & Maintenance Period.** This LTMMA shall commence when the City approves of the Work of the Plant Establishment Period and sends notice of the approval to the Contractor in accordance with **Part 8, Section 802** of the Construction Contract and shall continue for **25 months**. A copy of the approval form is attached as **Exhibit B**.

- 1.4. License.** The Contractor shall hold the following licenses in good standing:

1.4.1. C-27 State Contractor's License.

1.4.1.1. Alternatively, the Contractor shall retain the services of a Subcontractor with a **C-27 State Contractor's License**.

1.4.2. Pest Control Advisor's License.

1.4.2.1. Alternatively, the Contractor shall retain the services of a licensed Pest Control Advisor.

1.4.3. Registration with the County Agriculture Commission.

1.4.4. Qualified Applicator's Certificate for Category B. This shall apply to any person supervising the use of pesticides, herbicides, or rodenticides.

1.4.5. City of San Diego Business License.

Prior to performing the Work, the Contractor shall complete and submit to the City the License Data Sheet. **See Exhibit C.**

- 1.5. Hours of Performance.** The Contractor shall perform the Work between the hours of 8:30 a.m. and 3:30 p.m., Monday through Friday (Working Hours). The City may, in its sole discretion, grant permission to the Contractor to perform Work during non-Working Hours. Maintenance functions that generate excess noise (operations of power equipment which would cause annoyance to area residents for example) shall not begin before 7:00 a.m.

SECTION 2 - ADMINISTRATION

- 2.1. Contract Administrator. PUBLIC WORKS CONTRACTING (PWC)** is the Contract Administrator for the LTMMA. The Contractor shall perform the Work under the direction of a designated representative of the Public Works Department. The City will communicate with the Contractor on all matters related to the administration of this LTMMA and the Contractor's performance of the Work rendered hereunder. When this LTMMA refers to communications to or with the City, those communications shall be with the City, unless the City or this LTMMA specifies otherwise. Further, when this LTMMA requires an act or approval by City, that act or approval will be performed by the City.
- 2.2. Local Office.** The Contractor shall maintain a local office with a company representative who is authorized to discuss matters pertaining to this LTMMA with the City and shall promptly respond and be available during Normal Working Hours. A local office is one located in San Diego County that can be reached by telephone and facsimile. An answering service in conjunction with a company email address for the designated company representative may fulfill this requirement. A mobile telephone shall not fulfill the requirement for a local office. All calls to the Contractor from the City shall be returned within a 1-hour period.
- 2.3. Emergency Calls.** The Contractor shall have the capability to receive and to respond immediately to calls of an emergency nature. The City shall refer emergency calls to the Contractor for immediate disposition. The Contractor shall provide the City with a 24 hour emergency telephone number for this purpose.
- 2.4. Staffing.** The Contractor shall furnish supervisory and working personnel capable of promptly accomplishing all Work required under this LTMMA on schedule and to the satisfaction of the City.
- 2.5. Contractor Inspections.** The Contractor shall perform inspections of the Work site and shall prepare and submit to the City a Punchlist and dates of correction. The Punchlist shall include a comprehensive report of Work performed at the Work site to ensure 100% cover.

SETION 3: WORK SITE MAINTENANCE

- 3.1. Use of Chemicals.** The Contractor shall submit to the City for approval sample labels and MSDS for all chemical herbicides, rodenticides, and pesticides proposed for use under this LTRMC. Materials included shall be limited to chemicals approved by the State of California Department of Agriculture.

The use of any chemical shall be based on the recommendations of a licensed pest control advisor. Annual PCA Pesticide Recommendations are required for each pesticide proposed to be used for the Work site covered by this LTRMC. The use of chemicals shall conform to the current San Diego County Department of Agriculture regulations.

No chemical herbicide, rodenticide, or pesticide shall be applied until its use is approved, in writing, by City as appropriate for the purpose and area proposed.

The Contractor shall submit a monthly pesticide use report to the City along with the Contractor's invoices for payment. This report shall include a statement of all applications of herbicides, rodenticides, and pesticides, detailing the chemical used, undiluted quantity, rate of application, applicator's name, and the date and purpose of the application. For months in which no pesticides are applied, state "No Pesticide Used" on the report.

- 3.2. Irrigation Water.** The Contractor shall diligently practice water conservation, including minimizing run-off or other waste. The Contractor shall turn off irrigation systems, if any, during periods of rainfall and at such other times when suspension of irrigation is desirable to conserve water and to remain within the guidelines of good horticultural landscape maintenance practices in accordance with the instructions from the Project Biologist **(to be retained by the CITY)**. The Contractor's failure to properly manage and conserve water may result in deductions from the monthly payment to be made to the Contractor or other penalties under this LTMMA.

If the Contractor causes excessive use or waste of irrigation water, the estimated cost of that water shall be deducted from the monthly payment. Further, any monetary fines or other damages assessed to City for the Contractor's failure to follow water conservation regulations imposed by the City, the Public Utilities Department of the City of San Diego, and, where appropriate, the State of California, the County Water Authority, or other legal entities shall be solely the responsibility of the Contractor and may be deducted from the monthly payment to be made to the Contractor under this LTMMA.

- 3.3. Payment for Water.** The Contractor shall pay for the water used in the maintenance of the Work site and this cost is included in the price of this LTMMA.
- 3.4. Satisfactory Progression.** If the Revegetation/Restoration Area is not progressing towards the required performance criteria, as defined in the Scope of Work, in accordance with the Work Schedule, and as determined by City, the City may accordingly adjust monthly payments to the Contractor.

SECTION 4: COMPENSATION

- 4.1. Maximum Compensation.** The compensation for this LTMMA shall not exceed **\$CONTRACTOR'S LUMP SUM BID AMOUNT FOR THIS LONG-TERM MAINTENANCE AGREEMENT - TO BE ESTABLISHED DURING THE AWARD PROCESS. SEE EXHIBIT A.** (Contract Price).
- 4.2. Prevailing Wage Requirements.** The Prevailing Wages requirements in accordance with **Attachment D** of this Construction Contract are hereby incorporated by this reference.
- 4.3. Method of Payment and Reports.** The payments will be made monthly in direct proportion that each month bears to the total value of the Contract Price. As conditions precedent to payment, the Contractor shall submit a detailed invoice and report of maintenance Work performed every month. The Contractor's failure to submit the required reports or certified

payrolls as described in the Construction Contract shall constitute a basis for withholding payment by the City.

4.4. Final Payment. The Contractor shall not receive final payment until the following conditions have been completed to the City's satisfaction:

4.4.1 The item(s) of the Work subject to this maintenance coverage as specified in **Exhibit A** (Maintenance Items) have been determined to be in compliance with the Construction Contract and this LTMMA.

4.4.2 The Contractor has provided to the City a signed and notarized Affidavit of Disposal, a copy of which is attached to the Construction Contract, stating that all brush, trash, debris, and surplus materials resulting from the Work have been disposed of in a legal manner.

4.4.3 The Contractor has provided a final work summary report to the City.

4.4.4 The Contractor has performed comprehensive and successful testing and checks of the Maintenance Items.

SECTION 5: BONDS AND INSURANCE

5.1. Contract Bonds. Prior to the commencement of Work, the Contractor, at its sole cost and expense, shall provide the following bonds issued by a surety authorized to issue bonds in California satisfactory to the City:

5.1.1. A Payment Bond (Material and Labor Bond) in an amount not less than the Contract Price for this Bid item, to satisfy claims of material suppliers and mechanics and laborers employed by it on the Work. The Payment Bond shall be maintained by the Contractor in full force and effect until the Work is accepted by City and until all claims for materials and labor are paid, and shall otherwise comply with the California Civil Code.

5.1.2. A Performance Bond in an amount not less than the Contract Price for this bid item to guarantee the faithful performance of all Work within the time prescribed in a manner satisfactory to the City and to guarantee all materials and workmanship will be free from original or developed defects. The Performance Bond shall remain in full force and effect until performance of the Work is completed as set forth in this LTMMA.

5.2. Insurance. The Contractor shall maintain insurance coverage as specified in **Section 5-4, "INSURANCE"** of the Construction Contract at all times during the term of this LTMMA.

The Contractor shall not begin the Work under this LTMMA until they have complied with the following:

5.2.1. Obtain insurance certificates reflecting evidence of insurance:

1. Commercial General Liability

2. Commercial Automobile Liability
3. Worker's Compensation

5.2.2. Confirm that all policies contain the specific provisions required in **Section 5-4, "INSURANCE"**.

The Contractor shall submit copies of any policy upon request by the City.

The Contractor shall not modify any policy or endorsement thereto which increases the City's exposure to loss for the duration of this LTMMA.

SECTION 6: MISCELLANEOUS

- 6.1. Illness and Injury Prevention Program.** The Contractor shall comply with all the mandates of Senate Bill 198 and shall specifically have a written Injury Prevention Program on file with the City in accordance with all applicable standards, orders, or requirements of California Labor Code, Section 6401.7. This Program shall be on file prior to the performance of any Work.
- 6.2. City Standard Provisions.** This LTMMA is subject to the same standard provisions and Contractor Certification requirements as the Construction Contract.
- 6.3. Taxpayer Identification Number.** I.R.S. regulations require the City to have the correct name, address, and Taxpayer Identification Number (TIN) or Social Security Number (SSN) on file for businesses or persons who provide services or products to the City. This information is necessary to complete Form 1099 at the end of each tax year. As such, the Contractor shall provide the City with a Form W-9 upon execution of this LTMMA.
- 6.4. Assignment.** The Contractor shall not assign the obligations under this LTMMA, whether by express assignment or by sale of the company, nor any monies due or to become due, without the City's prior written approval. Any assignment in violation of this section shall constitute a Default and is grounds for immediate termination of this LTMMA, at the sole discretion of City. In no event shall any putative assignment create a contractual relationship between the City and any putative assignee.
- 6.5. Independent Contractors.** The Contractor and any Subcontractors employed by Contractor shall be independent contractors and not agents of the City. Any provisions of this LTMMA that may appear to give the City any right to direct the Contractor concerning the details of performing the Work, or to exercise any control over such performance, shall mean only that the Contractor shall follow the direction of the City concerning the end results of the performance.
- 6.6. Covenants and Conditions.** All provisions of this LTMMA expressed as either covenants or conditions on the part of the City or the Contractor shall be deemed to be both covenants and conditions.

- 6.7. Jurisdiction and Venue.** The jurisdiction and venue for any suit or proceeding arising out of or concerning this LTMMA, the interpretation or application of any of its terms, or any related disputes shall be the County of San Diego, State of California.
- 6.8. Successors in Interest.** This LTMMA and all rights and obligations created by it shall be in force and effect whether or not any Parties to this LTMMA have been succeeded by another entity and all rights and obligations created by this LTMMA shall be vested and binding on any Party's successor in interest.
- 6.9. Integration.** This LTMMA and the exhibits, attachments, and references incorporated into this LTMMA fully express all understandings of the Parties concerning the matters covered in this LTMMA. No change, alteration, or modification of the terms or conditions of this LTMMA, and no verbal understanding of the Parties, their officers, agents, or employees shall be valid unless made in the form of a written change agreed to in writing by both Parties or by an amendment to this LTMMA agreed to by both Parties. All prior negotiations and agreements shall be merged into this LTMMA.
- 6.10. Counterparts.** This LTMMA may be executed in counterparts, which when taken together shall constitute a single signed original as though all Parties had executed the same page.
- 6.11. No Waiver.** Any failure of either the City or the Contractor to insist upon the strict performance by the other of any covenant, term, or condition of this LTMMA, nor any failure to exercise any right or remedy consequent upon a breach of any covenant, term, or condition of this LTMMA, shall constitute a waiver of any such breach or of such covenant, term, or condition. No waiver of any breach shall affect or alter this LTMMA, and each and every covenant, condition, and term hereof shall continue in full force and effect to any existing or subsequent breach.
- 6.12. Severability.** The unenforceability, invalidity, or illegality of any provision of this LTMMA shall not render any other provision of this LTMMA unenforceable, invalid, or illegal.

6.13. Signing Authority. The representative for each Party signing on behalf of a corporation, partnership, joint venture or governmental entity hereby declares that authority has been obtained to sign on behalf of the corporation, partnership, joint venture, or entity and agrees to hold the other Party or Parties hereto harmless if it is later determined that such authority does not exist.

IN WITNESS WHEREOF, this Contract is executed by the City of San Diego, acting by and through its Public Works Department Director in accordance with Resolution No. R-**INSERT NUMBER OF RESOLUTION AUTHORIZING ADVERTISING AND AWARD OF THE UNDERLYING CONSTRUCTION CONTRACT**, and by Contractor.

Dated this _____ day of _____, **INSERT YEAR.**

THE CITY OF SAN DIEGO

By: _____

Mayor or designee

I HEREBY CERTIFY I can legally bind **NAME OF CONTRACTOR TO BE DETERMINED DURING AWARD PROCESS** and that I have read this entire contract, this _____ day of _____, **INSERT YEAR.**

By: _____

Printed Name: _____

Title: _____

I HEREBY APPROVE the form of the foregoing Contract this

_____ day _____ of **INSERT YEAR.**

Mara W. Elliott, City Attorney

By: _____

Printed Name: _____

Deputy City Attorney

EXHIBIT A

SCOPE OF WORK

- I. Location of Work.** The location of the Work to be performed (Revegetation Area) is shown on Specifications and Drawings numbered **37333-51-D** (Specifications), which are incorporated into this Contract by this reference as though fully set forth herein.
- II. Description of Work.** The Contractor shall maintain the Revegetation/Restoration Area during the Monitoring Program in accordance with this Contract. The Revegetation/Restoration Area shall meet the success criteria specified below at each of the milestones listed in the Schedule for the maintenance and monitoring period. The Work includes complete landscape maintenance consisting of irrigation, pruning, shaping and training of trees, shrubs, and ground cover plants; fertilization; weed control; control of all plant diseases and pests; and trash removal, and all other maintenance listed in this Contract and as required to maintain the Revegetation Area in a useable condition and to maintain the plant material in a healthy and viable state.

Work specified will be considered successfully implemented at the end of the **25 Month M** Period when:

1. Native vegetative cover shall match adjacent habitat or be at least 50%, whichever is greater.
2. Non-native annual cover shall be less than 5%
3. Invasive non-native cover shall be 0%

III. Method of Performing Work.

A. Irrigation. Irrigation shall be applied to hydroseed in accordance with instructions from the Project Biologist. Irrigation delivery techniques and schedules will vary depending on the availability of a sprinkler irrigation system and weather patterns. Failure of an existing irrigation system to provide full and proper irrigation shall not relieve Contractor of the responsibility to provide adequate irrigation with full and proper coverage of all areas subject to this LTMMA.

1. In areas where an automatic sprinkler system is installed, Contractor shall periodically inspect the operation of the system for any malfunction. The maximum interval between inspections shall not exceed 7 Calendar Days. The Contractor shall maintain all sprinkler systems in such a way as to guarantee proper coverage and full working capability, and shall make whatever adjustments may be necessary to prevent excessive run-off into streets, rights-of-way, or other areas not meant to be irrigated. The cost of wasted water may be charged to Contractor.
2. All areas not adequately covered by a sprinkler system shall be irrigated by a portable irrigation method in accordance with instructions from the Project Biologist. The Contractor shall furnish all hoses, nozzles, sprinklers, etc. necessary to accomplish this supplementary irrigation. The Contractor shall

exercise due diligence to prevent water waste, erosion, and detrimental seepage into existing underground improvements and to existing structures.

3. Irrigation shall be accomplished as follows:
 - a) Planted and seeded areas shall be irrigated as required to maintain acceptable growth, viability and health, and to encourage deep rooting, in accordance with instructions from the Project Biologist. Planted and seeded areas shall be irrigated at a rate which keeps surface runoff to a minimum. The irrigation rate shall be adjusted to the needs of plant types, seasons and weather conditions.
4. **Maintenance of Irrigation System.** The Contractor shall keep controller and valve boxes (if any) clear of soil and debris and shall maintain the irrigation system at no additional cost to City, including replacement, repair, adjustment, raising or lowering, straightening and any other operation required for the continued proper operation of the system from the "cold" side of the water meter throughout the Revegetation/Restoration Area. The Contractor shall also be responsible for maintaining the painted surfaces of irrigation and lighting controller cabinets as well as the corresponding automatic irrigation battery numbers on the lids of the automatic control valve boxes (if any). The Contractor shall be responsible for light bulb replacements in controller cabinets as necessary.
 - a) Repair or replacement includes: sprinkler system laterals (piping), sprinkler mains (pressure lines), vacuum breakers, sprinkler control valves, sprinkler controllers, sprinkler heads, sprinkler caps, sprinkler head risers, valve covers, boxes and lids (including electrical pull boxes and lids), valve sleeves and lids, quick coupler valves and hose bibs. Any replacement shall conform to the type and kind of existing system. Any deviation shall be approved in writing by City.
 - b) The Contractor shall repair irrigation systems which are damaged or altered in any way, including by acts of God, vandalism, vehicular damage, or theft.
5. **Operation of Automatic Irrigation Controllers.** Where the operation of automatic irrigation controllers is required as part of this LTRMC, the Contractor shall:
 - a) Not duplicate any coded City key furnished by City for access and operation of the controller;
 - b) Surrender all keys furnished by City, promptly at the end of the term of this LTRMC, or at any time deemed necessary by City to prevent serious loss to City;
 - c) protect the security of City's property by keeping controller cabinet and building doors locked at all times; and
 - d) refrain from using premises behind locked doors for storage of materials, supplies, or tools except as approved by City.

B. Pruning Shrubs and Ground Cover Plants. The Contractor shall prune all shrubs and ground cover plants growing in the Revegetation Area as required to:

1. Maintain plant growth viability and health, and to encourage deep rooting, in accordance with instructions from the Project Biologist.
2. Prevent encroachment of passage ways, walks, streets, or view of signs; and
3. Prevent encroachment in any manner deemed objectionable by the City.

The Contractor shall remove dead or damaged limbs with sharp pruning tools, with no stubs remaining. The Contractor shall seal any pruning cut which exceeds 2 inches in diameter with an approved pruning paint when required by the City. The Contractor shall perform pruning to permit plants to grow naturally in accordance with their normal growth characteristics except where box hedging is required by the City. The Contractor shall not shear, hedge, or severely prune plants, unless authorized by the City. The Contractor shall not use growth regulators.

C. Tree Maintenance. The Contractor shall maintain all trees and container plants in the revegetation area in accordance with instructions from the Project Biologist. The Contractor shall perform pruning in accordance with instructions from the Project Biologist, when necessary. The Contractor shall not top trees.

1. **Potential Hazards.** The Contractor shall notify the City within 24 hours of any tree that shows signs of root heaving or leaning, or is in any manner a potential safety hazard. The Contractor shall immediately reestablish trees and shrubs that are uprooted due to storms, if possible. If trees or shrubs cannot be reestablished, Contractor shall remove them immediately (including roots) and fill the holes until replacement planting is complete.
2. **Replacement.** The Contractor shall completely remove and replace trees lost due to Contractor's faulty maintenance or negligence, as determined by the City. The Contractor shall replace trees in kind and size as determined by the City. If there is a difference in value between the tree lost and the replacement tree, the City will deduct the difference from payment to be made under this LTMMA. The City shall determine the value of the tree lost using the latest International Society of Arboriculture (I.S.A.) guidelines for value determination.
3. **Staking.** The Contractor shall securely stake any newly planted trees and other trees needing support with two "lodge pole" type stakes placed on opposite sides of the tree outside the root ball and secured to the tree with at least two flexible rubber tree ties. The Contractor shall regularly inspect tree ties and stakes and reposition them as necessary to ensure against girdling and abrasion.

D. Fertilization. The Contractor shall fertilize the Revegetation Area as necessary in accordance with instructions from the Project Biologist. Contractor shall submit to City Material Safety Data Sheets and a schedule of application showing the site, date, and approximate time of fertilizer application (Fertilizer Schedule). The Fertilization Schedule, regardless of its intensity, timing, or the number of sites covered daily or

weekly, shall not excuse Contractor from performing any other Work regularly required under this LTMMA. All fertilization shall first be approved by the Project Biologist.

1. The Contractor shall notify the City at least 48 hours before beginning any fertilization. Fertilizer shall be delivered to the site only in the original unopened containers bearing the manufacturer's guaranteed analysis. Damaged packages shall not be accepted. The Contractor shall furnish to the City with duplicate signed, legible copies of all certificates and invoices for all fertilizer to be used for this LTMMA. The invoices shall state the grade, amount and quantity received. Both the copy to be retained by the City and the Contractor's copy shall be signed by the City, on site, before any fertilizer may be used.
2. Fertilizers, if necessary, shall be applied at the direction of the Project Biologist and according to manufacturer's product specifications.
3. If deemed necessary by the City to achieve required results, the Contractor shall apply other materials as directed by the City, including:
 - a) iron chelate;
 - b) soil sulfur;
 - c) gypsum; or
 - d) surfactant enzymes such as Sarvon or Naiad.
4. The Contractor shall adequately irrigate the fertilized area(s) immediately following the application of fertilizers and/or amendments to force fertilizer material to rest directly on the soil surface. Drip irrigated areas shall be adequately hand watered using quick coupler valves and hoses to dissolve fertilizer.

E. Weed Removal. The Contractor shall completely remove weeds from the Revegetation Area, including all turf grass areas, shrub and ground cover areas, planters, tree wells, and cracks in paved areas, including sidewalks, parking lot, gutters and curbs, as shown on the Work Schedule. For the purposes of this Section, "Weed" means any undesirable or misplaced plant. The Contractor shall control Weeds by manual, mechanical, or chemical methods. The City or Project Biologist may restrict the use of chemical weed control in certain areas.

Weed removal in areas with native habitat shall be in accordance with **Section 802 of the Whitebook.**

F. Disease and Pest Control. The Contractor shall regularly inspect the Revegetation Area for the presence of disease and insect or rodent infestation. The Contractor shall notify the City within 4 Calendar Days if disease or insect or rodent infestation is discovered. In its notice to the City, the Contractor shall identify the disease, insect, or rodent and specify the control measures to be taken. Upon approval of the City, the Contractor shall implement the approved control measures, exercising extreme

caution in the application of all sprays, dusts, or other materials utilized. The Contractor shall continue the approved control measures until the disease, insect, or rodent is controlled to the satisfaction of the City.

1. All individuals who supervise the mixing and application of herbicides, pesticides, and rodenticides on behalf of the Contractor shall possess valid Qualified Applicators Certificate for Category B issued to them by the State Department of Food and Agriculture.
2. The Contractor shall utilize all safeguards necessary during disease, insect or rodent control operations to ensure safety of the public and the employees of the Contractor, in accordance with current standard practices accepted by the State of California Department of Food and Agriculture. If the Contractor is unable to control the pest or disease, a pest control company will be hired and the cost shall be deducted from Contractor's monthly payment.

G. Plant Replacement. Except as provided in **Section H** below, the Contractor shall notify the City within 4 Calendar Days of the loss of plant material due to any cause.

1. The Contractor shall, at no cost to the City, replace any tree, shrub, ground cover, or other plant which is damaged or lost as a result of Contractor's faulty maintenance or negligence. The size and species of replacement plant materials shall be as directed by the City.
2. If so directed by the City, the Contractor shall replace any plant damaged or lost that is not a result of the Contractor's faulty maintenance or negligence. The size and species of replacement plant materials shall be as directed by City. The City will pay for materials and labor outside of warranty.
3. The City may determine that certain plants should be replaced in order to ensure maximum ecological health and overall aesthetic appearance of planting in the Revegetation Area. When the City determines such replacement should occur, Contractor shall replace the plants as directed by the City. The City will pay for materials and labor outside of warranty.

H. Damage Reports. The Contractor shall notify the City within 24 hours of any damage to the Work Area caused by accident, vandalism, or theft.

I. Litter. The Contractor shall promptly dispose of all trash and debris at an appropriate City disposal site. The Contractor shall pay any and all fees associated with the disposal of debris or trash accumulated under the terms of this LTMMA. The Contractor understands that disposal of refuse at City landfills is subject to a fee and that the Refuse Disposal Division can be contacted at (619) 573-1418 for fee information.

1. **Contractor Generated Litter.** The Contractor shall promptly remove all debris generated by the Contractor's pruning, trimming, weeding, edging and other Work required by this LTMMA. Immediately after working in streets, park walks, gutters, driveways, and paved areas, the Contractor shall clean them in accordance with all applicable laws.

2. **Third Party Generated Litter.** Upon discovery, the Contractor shall remove all litter, including bottles, glass, cans, paper, cardboard, fecal matter, leaves, branches, metallic items, and other debris, from the Work site.
- J. Monitoring.** The Project Biologist will oversee all maintenance operations and conduct qualitative and quantitative biological monitoring of the Revegetation Area according to the schedule and methods described in the Revegetation Plan. The Project Biologist will be responsible for preparing and submitting monitoring reports according to the schedule and instructions in the Revegetation Plan. The Project Biologist shall meet all requirements specified in **Section 802 of the Whitebook.**
- K. Final Site Cleanup.** Prior to completion of the LTMMA, all temporary irrigation materials, BMP's, and signs shall be removed from the site and properly disposed of.

EXHIBIT B

**INSERT A COPY OF THE ENGINEER'S FIELD NOTIFICATION WHICH ESTABLISHES THE
COMMENCEMENT DATE OF THE MONITORING PROGRAM, SEE THE 2018 WHITEBOOK, SECTION
802**

EXHIBIT C

LICENSE DATA SHEET

State Contractor License Classification and Number:_____

Name of License Holder:_____

Expiration Date:_____

City of San Diego Business License Number:_____

Expiration Date:_____

APPENDIX M
SAMPLE ARCHAEOLOGY INVOICE

(FOR ARCHAEOLOGY ONLY)

Company Name

Address, telephone, fax

Date: Insert Date

To: Name of Resident Engineer
City of San Diego
Field Engineering Division
9485 Aero Drive
San Diego, CA 92123-1801

Project Name: Insert Project Name

SAP Number (WBS/IO/CC): Insert SAP Number

Drawing Number: Insert Drawing Number

Invoice period: Insert Date to Insert Date

Work Completed: Bid item Number – Description of Bid Item – Quantity – Unit Price– Amount

Detailed summary of work completed under this bid item: Insert detailed description of Work related to Archaeology Monitoring Bid item. See Note 1 below.

Summary of charges:

Description of Services	Name	Start Date	End Date	Total Hours	Hourly Rate	Amount
Field Archaeologist	Joe Smith	8/29/2011	9/2/2011	40	\$84	\$3,360
Laboratory Assistant	Jane Doe	8/29/2011	9/2/2011	2	\$30	\$60
Subtotal						\$3,420

Work Completed: Bid item Number – Description of Bid Item – Quantity – Unit Price– Amount

Detailed summary of work completed under this bid item: Insert detailed description of Work related to Archaeology Curation/Discovery Bid item. See Note 2 below.

Summary of charges:

Description of Services	Where work occurred (onsite vs offsite/lab)	Name	Start Date	End Date	Total Hours	Hourly Rate	Amount
Field Archaeologist		Joe Smith	8/29/2011	9/2/2011	40	\$84	\$3,360
Laboratory Assistant		Jane Doe	8/29/2011	9/2/2011	2	\$30	\$60
Subtotal							\$3,420

Total this invoice: \$ _____

Total invoiced to date: \$ _____

Note 1:

For monitoring related bid items or work please include summary of construction work that was monitored from Station to Station, Native American monitors present, MMC coordination, status and nature of monitoring and if any discoveries were made.

Note 2:

For curation/discovery related bid items or work completed as part of a discovery and curation process, the PI must provide a response to the following questions along with the invoice:

1. Preliminary results of testing including tentative recommendations regarding eligibility for listing in the California Register of Historical Resources (California Register).
 - a. Please briefly describe your application (consideration) of all four California Register criteria.
 - b. If the resource is eligible under Criterion D, please define the important information that may be present.
 - c. Were specialized studies performed? How many personnel were required? How many Native American monitors were present?
 - d. What is the age of the resource?
 - e. Please define types of artifacts to be collected and curated, including quantity of boxes to be submitted to the San Diego Archaeological Center (SDAC). How many personnel were required? How many Native American monitors were present?
2. Preliminary results of data recovery and a definition of the size of the representative sample.
 - a. Were specialized studies performed? Please define types of artifacts to be collected and curated, including quantity of boxes to be submitted to the SDAC. How many personnel were required? How many Native American monitors were present?
3. What resources were discovered during monitoring?
4. What is the landform context and what is the integrity of the resources?
5. What additional studies are necessary?
6. Based on application of the California Register criteria, what is the significance of the resources?
 - a. If the resource is eligible for the California Register, can the resource be avoided by construction?
 - b. If not, what treatment (mitigation) measures are proposed? Please define data to be recovered (if necessary) and what material will be submitted to the SDAC for curation. Are any specialized studies proposed?

(After the first invoice, not all the above information needs to be re-stated, just revise as applicable).

APPENDIX N
SAMPLE OF PUBLIC NOTICE



CONSTRUCTION NOTICE

PROJECT TITLE

Work on your street will begin within one week to replace the existing water mains servicing your community.

The work will consist of:

- Saw-cutting and trench work on Ingulf Street from Morena Boulevard to Galveston Street to install new water mains, water laterals and fire hydrants.
• Streets where trenching takes place will be resurfaced and curb ramps will be upgraded to facilitate access for persons with disabilities where required.
• This work is anticipated to be complete in your community by December 2016.

How your neighborhood may be impacted:

- Water service to some properties during construction will be provided by a two-inch highline pipe that will run along the curb. To report a highline leak call 619-515-3525.
• Temporary water service disruptions are planned. If planned disruptions impact your property, you will receive advance notice.
• Parking restrictions will exist because of the presence of construction equipment and materials.
• "No Parking" signs will be displayed 72 hours in advance of the work.
• Cars parked in violation of signs will be TOWED.

Hours and Days of Operation:

Monday through Friday X:XX AM to X:XX PM.

City of San Diego Contractor:

Company Name, XXX-XXX-XXXX



CONSTRUCTION NOTICE

PROJECT TITLE

Work on your street will begin within one week to replace the existing water mains servicing your community.

The work will consist of:

- Saw-cutting and trench work on Ingulf Street from Morena Boulevard to Galveston Street to install new water mains, water laterals and fire hydrants.
• Streets where trenching takes place will be resurfaced and curb ramps will be upgraded to facilitate access for persons with disabilities where required.
• This work is anticipated to be complete in your community by December 2016.

How your neighborhood may be impacted:

- Water service to some properties during construction will be provided by a two-inch highline pipe that will run along the curb. To report a highline leak call 619-515-3525.
• Temporary water service disruptions are planned. If planned disruptions impact your property, you will receive advance notice.
• Parking restrictions will exist because of the presence of construction equipment and materials.
• "No Parking" signs will be displayed 72 hours in advance of the work.
• Cars parked in violation of signs will be TOWED.

Hours and Days of Operation:

Monday through Friday X:XX AM to X:XX PM.

City of San Diego Contractor:

Company Name, XXX-XXX-XXXX

To contact the City of San Diego: SD Public Works 619-533-4207 | engineering@sandiego.gov | sandiego.gov/CIP

To contact the City of San Diego: SD Public Works 619-533-4207 | engineering@sandiego.gov | sandiego.gov/CIP

APPENDIX O

ADVANCED METERING INFRASTRUCTURE (AMI) DEVICE PROTECTION

Protecting AMI Devices in Meter Boxes and on Street Lights

The Public Utilities Department (PUD) has begun the installation of the Advanced Metering Infrastructure (AMI) technology as a new tool to enhance water meter reading accuracy and efficiency, customer service and billing, and to be used by individual accounts to better manage the efficient use of water. **All AMI devices shall be protected per Section 5-2, "Protection", of the 2015 Whitebook.**

AMI technology allows water meters to be read electronically rather than through direct visual inspection by PUD field staff. This will assist PUD staff and customers in managing unusual consumption patterns which could indicate leaks or meter tampering on a customer's property.

Three of the main components of an AMI system are the:

- A. Endpoints, see Photo 1:

Photo 1



- B. AMI Antenna attached to Endpoint (antenna not always required), see Photo 2:

Photo 2



Network Devices, see Photo 3:

Photo 3



AMI endpoints transmit meter information to the AMI system and will soon be on the vast majority of meters in San Diego. These AMI devices provide interval consumption data to the PUD's Customer Support Division. If these devices are damaged or communication is interrupted, this Division will be alerted of the situation. The endpoints are installed in water meter boxes, coffins, and vaults adjacent to the meter. A separate flat round antenna may also be installed through the meter box lid. This antenna is connected to the endpoint via cable. The following proper installation shall be implemented when removing the lid to avoid damaging the antenna, cable, and/or endpoint. Photo 4 below demonstrates a diagram of the connection:

Photo 4



The AMI device ERT/Endpoint/Transmitter shall be positioned and installed as discussed in this Appendix. If the ERT/Endpoint/Transmitter is disturbed, it shall be re-installed and returned to its original installation with the end points pointed upwards as shown below in Photo 5.

The PUD's code compliance staff will issue citations and invoices to you for any damaged AMI devices that are not re-installed as discussed in the Contract Document

Photo 5 below shows a typical installation of an AMI endpoint on a water meter.

Photo 5

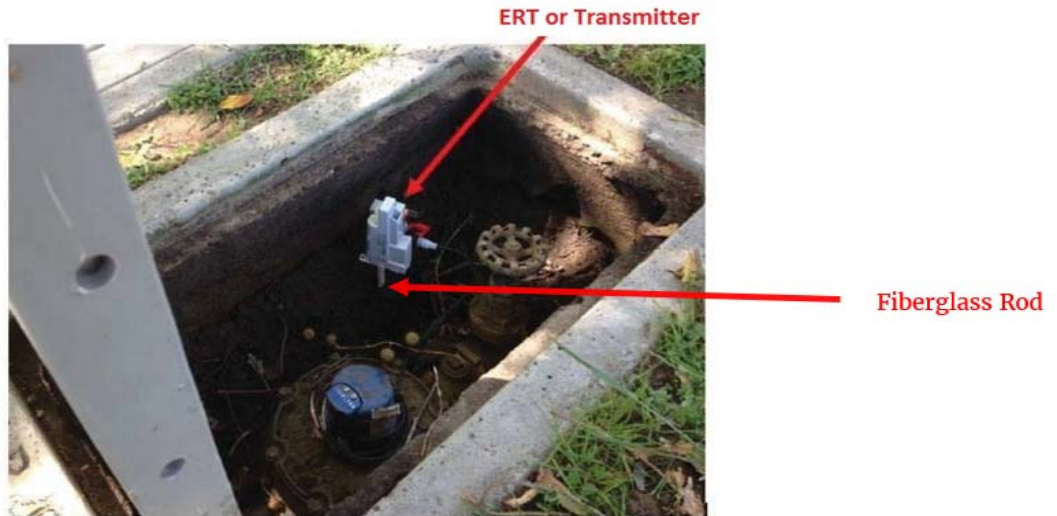


Photo 6 below is an example of disturbance that shall be avoided:

Photo 6



You are responsible when working in and around meter boxes. If you encounter these endpoints, use proper care and do not disconnect them from the registers on top of the water meter. If the lid has an antenna drilled through, do not change or tamper with the lid and inform the Resident Engineer immediately about the location of that lid. Refer to Photo 7 below:

Photo 7



Another component of the AMI system are the Network Devices. The Network Devices are strategically placed units (mainly on street light poles) that collect interval meter reading data from multiple meters for transmission to the Department Control Computer. **If you come across any of these devices on street lights that will be removed or replaced (refer to Photos 8 and 9 below), notify AMI Project Manager Arwa Sayed at (619) 362-0121 immediately.**

Photo 8 shows an installed network device on a street light. On the back of each Network Device is a sticker with contact information. See Photo 9. **Call PUD Water Emergency Repairs at 619-515-3525 if your work will impact these street lights.** These are assets that belong to the City of San Diego and you shall be responsible for any costs of disruption of this network.

Photo 8



Network Device

Photo 9



If you encounter any bad installations, disconnected/broken/buried endpoints, or inadvertently damage any AMI devices or cables, notify the Resident Engineer immediately. The Resident Engineer will then immediately contact the AMI Project Manager, Arwa Sayed, at (619) 362-0121.

APPENDIX P

OSHA CLASSIFICATION MID CITY

DEPARTMENT OF INDUSTRIAL RELATIONS
**DIVISION OF OCCUPATIONAL SAFETY
AND HEALTH ADMINISTRATION**
MINING AND TUNNELING UNIT
6150 VAN NUYS BOULEVARD, SUITE 310
VAN NUYS, CA 91401-3333
(818) 901-5420 FAX (818) 901-5579



RECEIVED
JAN 14 2016
PSOMAS

January 7, 2016

PSOMAS
3111 Camino Del Rio North, Suite 702
San Diego, CA 92108

Attention: Michael A. Pollard, P.E.
Senior Project Manager

Subject: Underground Classification Numbers: C070-073-16T to C072-073-16T
Mid-City Pipeline Phase II

Dear Mr. Pollard,

The information provided to this office regarding the referenced project has been reviewed. An Underground Classification of "Potentially Gassy" has been assigned to the tunnels identified in your submittal. Please provide copies of the Classifications to the Tunnel Contractor and ensure that copies of the Classifications are posted at the job site.

Please remind the Contractor to notify this office to schedule the mandated Pre-Job Safety Conference with the Division prior to commencing any activity associated with the project.

If you have any questions, please contact this office.

Sincerely,

A handwritten signature in black ink, appearing to read 'James Wittry'.

James Wittry
District Manager

cc: file



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

C070-073-16T

Van Nuys Office R5D2

Underground Classification

Mid City Pipeline, Phase II
City of San Diego

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

of PSOMAS for: City of San Diego
525 "B" Street, Suite 750, MS 908A San Diego, CA 92101
(MAILING ADDRESS)

at Lake Murray Boulevard, north of Interstate 8
La Mesa, California
(LOCATION)

has been classified as *** POTENTIALLY GASSY ***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

A 84 inch diameter steel casing (to accommodate a 66 inch diameter carrier pipe) approximately 27 feet in length to be installed along Lake Murray Boulevard, approximately 1,140 feet north of Highway 8 between station 45+42 and station 45+69, in the City of La Mesa, California.

January 6, 2016

Reference: Submittal from PSOMAS for the City of San Diego dated December 2, 2015

District Manager



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

C071-073-16T

Van Nuys Office R5D2

Underground Classification

Mid City Pipeline, Phase II
City of San Diego

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

PSOMAS for: City of San Diego

of 525 "B" Street, Suite 750, MS 908A San Diego, CA 92101
(MAILING ADDRESS)

Lake Murray Boulevard, near Interstate 8
La Mesa and San Diego, California

at (LOCATION)

has been classified as *** POTENTIALLY GASSY ***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

A 84 inch diameter steel casing (to accommodate a 66 inch diameter carrier pipe) approximately 711 feet in length to be installed under Interstate 8 from Lake Murray Boulevard to a parking lot located on Alvarado Road at a Denny's restaurant between station 30+91 and station 38+02, in the cities of La Mesa and San Diego, California.

January 6, 2016

Reference: Submittal from PSOMAS for the City of San Diego dated December 2, 2015

District Manager



State of California

Department of Industrial Relations

DIVISION OF OCCUPATIONAL SAFETY AND HEALTH
MINING AND TUNNELING UNIT

C072-073-16T

Van Nuys Office R5D2

Underground Classification

Mid City Pipeline, Phase II
City of San Diego

(NAME OF TUNNEL OR MINE AND COMPANY NAME)

PSOMAS for: City of San Diego

of 525 "B" Street, Suite 750, MS 908A San Diego, CA 92101
(MAILING ADDRESS)

at El Cajon Boulevard and 69th Street
San Diego, California
(LOCATION)

has been classified as *** POTENTIALLY GASSY ***
(CLASSIFICATION)

as required by the California Labor Code Section 7955.

The Division shall be notified if sufficient quantities of flammable gas or vapors have been encountered underground. Classifications are based on the California Labor Code Part 9, Tunnel Safety Orders and Mine Safety Orders.

A 84 inch diameter steel casing (to accommodate a 66 inch diameter carrier pipe) approximately 62 feet in length to be installed between station 4+30 and station 4+92, in the City of San Diego, California.

January 6, 2016

Reference: Submittal from PSOMAS for the City of San Diego dated December 2, 2015


District Manager

ATTACHMENT F

RESERVED

ATTACHMENT G
CONTRACT AGREEMENT

CONTRACT AGREEMENT

CONSTRUCTION CONTRACT

This contract is made and entered into between THE CITY OF SAN DIEGO, a municipal corporation, herein called "City", and **James W. Fowler Co.** herein called "Contractor" for construction of **Montezuma PPL/Mid-City Pipeline Ph2 and 70th-Alvarado to Saranac-Sidewalk**; Bid No. **K-19-1821-DBB-3**; in the amount of **THIRTY THREE MILLION SIX HUNDRED THIRTY NINE THOUSAND THREE HUNDRED SEVENTY SEVEN DOLLARS AND TWENTY CENTS (\$33,639,377.20)** which is comprised of the Base Bid plus Additive Alternate A.

IN CONSIDERATION of the payments to be made hereunder and the mutual undertakings of the parties hereto, City and Contractor agree as follows:

1. The following are incorporated into this contract as though fully set forth herein:
 - (a) The attached Faithful Performance and Payment Bonds.
 - (b) The attached Proposal included in the Bid documents by the Contractor.
 - (c) Reference Standards listed in the Instruction to Bidders and the Supplementary Special Provisions (SSP).
 - (d) Phased Funding Schedule Agreement Long-Term Maintenance and Monitoring Agreement.
 - (e) That certain documents entitled **Montezuma PPL/Mid-City Pipeline Ph2 and 70th-Alvarado to Saranac-Sidewalk**, on file in the office of the City Clerk as Document No. **S-11026 and B-17065**, as well as all matters referenced therein.
2. The Contractor shall perform and be bound by all the terms and conditions of this contract and in strict conformity therewith shall perform and complete in a good and workmanlike manner **Montezuma PPL/Mid-City Pipeline Ph2 and 70th-Alvarado to Saranac-Sidewalk**, Bid Number **K-19-1821-DBB-3**, San Diego, California.
3. For such performances, the City shall pay to Contractor the amounts set forth at the times and in the manner and with such additions or deductions as are provided for in this contract, and the Contractor shall accept such payment in full satisfaction of all claims incident to such performances.
4. No claim or suit whatsoever shall be made or brought by Contractor against any officer, agent, or employee of the City for or on account of anything done or omitted to be done in connection with this contract, nor shall any such officer, agent, or employee be liable hereunder.
5. This contract is effective as of the date that the Mayor or designee signs the agreement.

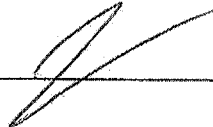
CONTRACT AGREEMENT (continued)

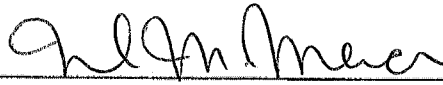
IN WITNESS WHEREOF, this Agreement is signed by the City of San Diego, acting by and through its Mayor or designee, pursuant to Municipal Code §22.3102 authorizing such execution.

THE CITY OF SAN DIEGO

APPROVED AS TO FORM

Mara W. Elliott, City Attorney

By 

By 

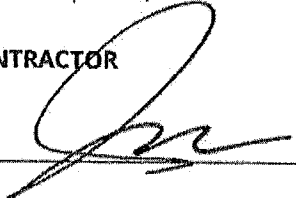
Print Name: James Nagelvoort
Director
Public Works Department

Print Name: Mark M. Merce
Deputy City Attorney

Date: 10/10/19

Date: 10/10/19

CONTRACTOR

By 

Print Name: James Fowler

Title: President

Date: 8-1-19

City of San Diego License No.: B2018001538

State Contractor's License No.: 777391

DEPARTMENT OF INDUSTRIAL RELATIONS (DIR) REGISTRATION NUMBER: 1000002667

CERTIFICATIONS AND FORMS

The Bidder, by submitting its electronic bid, agrees to and certifies under penalty of perjury under the laws of the State of California, that the certifications, forms and affidavits submitted as part of this bid are true and correct.

BIDDER'S GENERAL INFORMATION

To the City of San Diego:

Pursuant to "Notice Inviting Bids", specifications, and requirements on file with the City Clerk, and subject to all provisions of the Charter and Ordinances of the City of San Diego and applicable laws and regulations of the United States and the State of California, the undersigned hereby proposes to furnish to the City of San Diego, complete at the prices stated herein, the items or services hereinafter mentioned. The undersigned further warrants that this bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

The undersigned bidder(s) further warrants that bidder(s) has thoroughly examined and understands the entire Contract Documents (plans and specifications) and the Bidding Documents therefore, and that by submitting said Bidding Documents as its bid proposal, bidder(s) acknowledges and is bound by the entire Contract Documents, including any addenda issued thereto, as such Contract Documents incorporated by reference in the Bidding Documents.

**NON-COLLUSION AFFIDAVIT TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID UNDER 23
UNITED STATES CODE 112 AND PUBLIC CONTRACT CODE 7106**

State of California

County of San Diego

The bidder, being first duly sworn, deposes and says that he or she is authorized by the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

CONTRACTOR CERTIFICATION

DRUG-FREE WORKPLACE

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-17 regarding Drug-Free Workplace as outlined in the WHITEBOOK, Section 5-1.3, "Drug-Free Workplace", of the project specifications, and that;

This company_has in place a drug-free workplace program that complies with said policy. I further certify that each subcontract agreement for this project contains language which indicates the subcontractor's agreement to abide by the provisions of subdivisions a) through c) of the policy as outlined.

CONTRACTOR CERTIFICATION

AMERICANS WITH DISABILITIES ACT (ADA) COMPLIANCE CERTIFICATION

I hereby certify that I am familiar with the requirements of San Diego City Council Policy No. 100-4 regarding the Americans With Disabilities Act (ADA) outlined in the WHITEBOOK, Section 5-1.2, "Americans With Disabilities Act", of the project specifications, and that:

This company has in place workplace program that complies with said policy. I further certify that each subcontract agreement for this project contains language which indicates the subcontractor's agreement to abide by the provisions of the policy as outlined.

CONTRACTOR CERTIFICATION

CONTRACTOR STANDARDS – PLEDGE OF COMPLIANCE

I declare under penalty of perjury that I am authorized to make this certification on behalf of the company submitting this bid/proposal, that as Contractor, I am familiar with the requirements of City of San Diego Municipal Code § 22.3004 regarding Contractor Standards as outlined in the WHITEBOOK, Section 5-1.4, ("Contractor Standards"), of the project specifications, and that Contractor has complied with those requirements.

I further certify that each of the Contractor's subcontractors has completed a Pledge of Compliance attesting under penalty of perjury of having complied with City of San Diego Municipal Code § 22.3004.

CONTRACTOR CERTIFICATION

EQUAL BENEFITS ORDINANCE CERTIFICATION

I declare under penalty of perjury that I am familiar with the requirements of and in compliance with the City of San Diego Municipal Code § 22.4300 regarding Equal Benefits Ordinance.

CONTRACTOR CERTIFICATION

EQUAL PAY ORDINANCE CERTIFICATION

Contractor shall comply with the Equal Pay Ordinance (EPO) codified in the San Diego Municipal Code (SDMC) at section 22.4801 through 22.4809, unless compliance is not required based on an exception listed in SDMC section 22.4804.

Contractor shall require all of its subcontractors to certify compliance with the EPO in their written subcontracts.

Contractor must post a notice informing its employees of their rights under the EPO in the workplace or job site.

By signing this Contract with the City of San Diego, Contractor acknowledges the EPO requirements and pledges ongoing compliance with the requirements of SDMC Division 48, section 22.4801 et seq., throughout the duration of this Contract.

AFFIDAVIT OF DISPOSAL

(To be submitted upon completion of Construction pursuant to the contracts Certificate of Completion)

WHEREAS, on the _____ DAY OF _____, 2____ the undersigned entered into and executed a contract with the City of San Diego, a municipal corporation, for:

Montezuma PPL/Mid-City Pipeline Ph2 and 70th-Alvarado to Saranac-Sidealk

(Project Title)

as particularly described in said contract and identified as Bid No. **K-19-1821-DBB-3**; SAP No. (WBS/IO/CC) **S-11026 and B-17065**; and **WHEREAS**, the specification of said contract requires the Contractor to affirm that "all brush, trash, debris, and surplus materials resulting from this project have been disposed of in a legal manner"; and **WHEREAS**, said contract has been completed and all surplus materials disposed of:

NOW, THEREFORE, in consideration of the final payment by the City of San Diego to said Contractor under the terms of said contract, the undersigned Contractor, does hereby affirm that all surplus materials as described in said contract have been disposed of at the following location(s)

and that they have been disposed of according to all applicable laws and regulations.

Dated this _____ DAY OF _____, _____.

By: _____
Contractor

ATTEST:

State of _____ County of _____

On this _____ DAY OF _____, 2____, before the undersigned, a Notary Public in and for said County and State, duly commissioned and sworn, personally appeared _____ known to me to be the _____ Contractor named in the foregoing Release, and whose name is subscribed thereto, and acknowledged to me that said Contractor executed the said Release.

Notary Public in and for said County and State

LIST OF SUBCONTRACTORS

***** PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY *** TO BE SUBMITTED IN ELECTRONIC FORMAT ONLY *** SEE INSTRUCTIONS TO BIDDERS FOR FURTHER INFORMATION**

In accordance with the requirements of the "Subletting and Subcontracting Fair Practices Act", Section 4100, of the California Public Contract Code (PCC), the Bidder is to list below the name, address and license number of each Subcontractor who will perform work, labor, render services or specially fabricate and install a portion [type] of the work or improvement, in an amount of or in excess of 0.5% of the Contractor's total Bid. Failure to comply with this requirement may result in the Bid being rejected as non-responsive. The Contractor is to list only one Subcontractor for each portion of the Work. The Bidder's attention is directed to the Special Provisions Section 3-2, "SELF-PERFORMANCE", which stipulates the percentage of the Work to be performed with the Bidder's own forces. The Bidder is to also list all SLBE, ELBE, DBE, DVBE, MBE, WBE, OBE, SDB, WoSB, HUBZone, and SDVOSB Subcontractors for which the Bidders are seeking recognition towards achieving any mandatory, voluntary, or both subcontracting participation percentages.

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	DIR REGISTRATION NUMBER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB®	WHERE CERTIFIED ②	CHECK IF JOINT VENTURE PARTNERSHIP
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____								
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____								

- ① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		
- ② As appropriate, Bidder shall indicate if Subcontractor is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC		
State of California's Department of General Services	CADoGS	City of Los Angeles	LA
State of California	CA	U.S. Small Business Administration	SBA

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

NAMED EQUIPMENT/MATERIAL SUPPLIER LIST

***** PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY *** TO BE SUBMITTED IN ELECTRONIC FORMAT ONLY *** SEE INSTRUCTIONS TO BIDDERS FOR FURTHER INFORMATION**

NAME, ADDRESS AND TELEPHONE NUMBER OF VENDOR/SUPPLIER	MATERIALS OR SUPPLIES	DIR REGISTRATION NUMBER	DOLLAR VALUE OF MATERIAL OR SUPPLIES	SUPPLIER (Yes/No)	MANUFACTURER (Yes/No)	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____							
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____							

- ① As appropriate, Bidder shall identify Vendor/Supplier as one of the following and shall include a valid proof of certification (except for OBE,SLBE and ELBE):
- | | | | |
|---|--------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOSB | | |
- ② As appropriate, Bidder shall indicate if Vendor/Supplier is certified by:
- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | | |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

SUBCONTRACTORS ADDITIVE/DEDUCTIVE ALTERNATE (USE ONLY WHEN ADDITIVE ALTERNATES ARE REQUIRED)

***** PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY *** TO BE SUBMITTED IN ELECTRONIC FORMAT ONLY *** SEE INSTRUCTIONS TO BIDDERS, FOR FURTHER INFORMATION**

ADDITIVE/ DEDUCTIVE ALTERNATE	NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTO R OR DESIGNER	SUBCONTRACT OR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB ^①	WHERE CERTIFIED ^②	CHECK IF JOINT VENTURE PARTNERS HIP
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____							
	Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____							

① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):

Certified Minority Business Enterprise	MBE	Certified Woman Business Enterprise	WBE
Certified Disadvantaged Business Enterprise	DBE	Certified Disabled Veteran Business Enterprise	DVBE
Other Business Enterprise	OBE	Certified Emerging Local Business Enterprise	ELBE
Certified Small Local Business Enterprise	SLBE	Small Disadvantaged Business	SDB
Woman-Owned Small Business	WoSB	HUBZone Business	HUBZone
Service-Disabled Veteran Owned Small Business	SDVOSB		

② As appropriate, Bidder shall indicate if Subcontractor is certified by:

City of San Diego	CITY	State of California Department of Transportation	CALTRANS
California Public Utilities Commission	CPUC	State of California's Department of General Services	CADoGS
City of Los Angeles	LA	State of California	CA
U.S. Small Business Administration	SBA		

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

ELECTRONICALLY SUBMITTED FORMS

THE FOLLOWING FORMS MUST BE SUBMITTED IN PDF FORMAT WITH BID SUBMISSION

The following forms are to be completed by the bidder and submitted (uploaded) electronically with the bid in PlanetBids.

- A. BID BOND – See Instructions to Bidders, Bidders Guarantee of Good Faith (Bid Security) for further instructions**
- B. CONTRACTOR’S CERTIFICATION OF PENDING ACTIONS**
- C. MANDATORY DISCLOSURE OF BUSINESS INTERESTS FORM**
- D. SUBCONTRACTOR LISTING (OTHER THAN FIRST TIER)**
- E. COMMITMENT TO COMPLY WITH SKILLED AND TRAINED WORKFORCE REQUIREMENTS**

BID BOND

**See Instructions to Bidders, Bidder Guarantee of Good Faith
(Bid Security)**

KNOW ALL MEN BY THESE PRESENTS,

That James W. Fowler Co. as Principal,
and Liberty Mutual Insurance Company as Surety, are held
and firmly bound unto The City of San Diego hereinafter called "OWNER," in the sum
of **10% OF THE TOTAL BID AMOUNT** for the payment of which sum, well and truly to be made, we
bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally,
firmly by these presents.

WHEREAS, said Principal has submitted a Bid to said OWNER to perform the WORK required under
the bidding schedule(s) of the OWNER's Contract Documents entitled

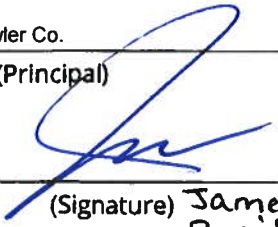
Montezuma PPL/Mid-City Pipeline Ph2 and 70th - Alvarado to Saranac-Sidewalk


NOW THEREFORE, if said Principal is awarded a contract by said OWNER and, within the time and in
the manner required in the "Notice Inviting Bids" enters into a written Agreement on the form of
agreement bound with said Contract Documents, furnishes the required certificates of insurance, and
furnishes the required Performance Bond and Payment Bond, then this obligation shall be null and
void, otherwise it shall remain in full force and effect. In the event suit is brought upon this bond by
said OWNER and OWNER prevails, said Surety shall pay all costs incurred by said OWNER in such suit,
including a reasonable attorney's fee to be fixed by the court.

SIGNED AND SEALED, this 11th day of June, 2019

James W. Fowler Co. (SEAL)
(Principal)

Liberty Mutual Insurance Company (SEAL)
(Surety)

By: 
(Signature) James W. Fowler
President

By: 
(Signature) Roger Kaltenbach
Attorney in Fact
CA License # 0155652

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY)



This Power of Attorney limits the acts of those named herein, and they have no authority to bind the Company except in the manner and to the extent herein stated.

Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

Certificate No: 8201163-023001

POWER OF ATTORNEY

KNOWN ALL PERSONS BY THESE PRESENTS: That The Ohio Casualty Insurance Company is a corporation duly organized under the laws of the State of New Hampshire, that Liberty Mutual Insurance Company is a corporation duly organized under the laws of the State of Massachusetts, and West American Insurance Company is a corporation duly organized under the laws of the State of Indiana (herein collectively called the "Companies"), pursuant to and by authority herein set forth, does hereby name, constitute and appoint, Guy Armfield, John Claeys, Scott Fisher, Nicholas Fredrickson, Deanna M. French, Scott Garcia, Elizabeth R. Hahn, Roger Kaltenbach, Ronald J. Lange, Andrew P. Larsen, Susan B. Larson, Scott McGilvray, Mindee L. Rankin, Jana M. Roy

all of the city of Bellevue state of Washington each individually if there be more than one named, its true and lawful attorney-in-fact to make, execute, seal, acknowledge and deliver, for and on its behalf as surety and as its act and deed, any and all undertakings, bonds, recognizances and other surety obligations, in pursuance of these presents and shall be as binding upon the Companies as if they have been duly signed by the president and attested by the secretary of the Companies in their own proper persons.

IN WITNESS WHEREOF, this Power of Attorney has been subscribed by an authorized officer or official of the Companies and the corporate seals of the Companies have been affixed thereto this 29th day of April, 2019.



Liberty Mutual Insurance Company
The Ohio Casualty Insurance Company
West American Insurance Company

By: David M. Carey
David M. Carey, Assistant Secretary

State of PENNSYLVANIA
County of MONTGOMERY ss

On this 29th day of April, 2019 before me personally appeared David M. Carey, who acknowledged himself to be the Assistant Secretary of Liberty Mutual Insurance Company, The Ohio Casualty Company, and West American Insurance Company, and that he, as such, being authorized so to do, execute the foregoing instrument for the purposes therein contained by signing on behalf of the corporations by himself as a duly authorized officer.

IN WITNESS WHEREOF, I have hereunto subscribed my name and affixed my notarial seal at King of Prussia, Pennsylvania, on the day and year first above written.



COMMONWEALTH OF PENNSYLVANIA
Notarial Seal
Teresa Pastella, Notary Public
Upper Merion Twp., Montgomery County
My Commission Expires March 28, 2021
Member, Pennsylvania Association of Notaries

By: Teresa Pastella
Teresa Pastella, Notary Public

This Power of Attorney is made and executed pursuant to and by authority of the following By-laws and Authorizations of The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company which resolutions are now in full force and effect reading as follows:

ARTICLE IV - OFFICERS: Section 12. Power of Attorney.

Any officer or other official of the Corporation authorized for that purpose in writing by the Chairman or the President, and subject to such limitation as the Chairman or the President may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Corporation to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact, subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Corporation by their signature and execution of any such instruments and to attach thereto the seal of the Corporation. When so executed, such instruments shall be as binding as if signed by the President and attested to by the Secretary. Any power or authority granted to any representative or attorney-in-fact under the provisions of this article may be revoked at any time by the Board, the Chairman, the President or by the officer or officers granting such power or authority.

ARTICLE XIII - Execution of Contracts: Section 5. Surety Bonds and Undertakings.

Any officer of the Company authorized for that purpose in writing by the chairman or the president, and subject to such limitations as the chairman or the president may prescribe, shall appoint such attorneys-in-fact, as may be necessary to act in behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations. Such attorneys-in-fact subject to the limitations set forth in their respective powers of attorney, shall have full power to bind the Company by their signature and execution of any such instruments and to attach thereto the seal of the Company. When so executed such instruments shall be as binding as if signed by the president and attested by the secretary.

Certificate of Designation - The President of the Company, acting pursuant to the Bylaws of the Company, authorizes David M. Carey, Assistant Secretary to appoint such attorneys-in-fact as may be necessary to act on behalf of the Company to make, execute, seal, acknowledge and deliver as surety any and all undertakings, bonds, recognizances and other surety obligations.

Authorization - By unanimous consent of the Company's Board of Directors, the Company consents that facsimile or mechanically reproduced signature of any assistant secretary of the Company, wherever appearing upon a certified copy of any power of attorney issued by the Company in connection with surety bonds, shall be valid and binding upon the Company with the same force and effect as though manually affixed.

I, Renee C. Llewellyn, the undersigned, Assistant Secretary, The Ohio Casualty Insurance Company, Liberty Mutual Insurance Company, and West American Insurance Company do hereby certify that the original power of attorney of which the foregoing is a full, true and correct copy of the Power of Attorney executed by said Companies, is in full force and effect and has not been revoked.

IN TESTIMONY WHEREOF, I have hereunto set my hand and affixed the seals of said Companies this 11th day of June, 2019.



By: Renee C. Llewellyn
Renee C. Llewellyn, Assistant Secretary

Not valid for mortgage, note, loan, letter of credit, currency rate, interest rate or residual value guarantees.

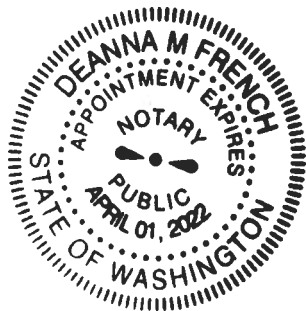
To confirm the validity of this Power of Attorney call 1-610-832-8240 between 9:00 am and 4:30 pm EST on any business day.

ACKNOWLEDGMENT BY SURETY

State of Washington)
County of King)

On this 11th day of June, 2019, before me, Deanna M. French notary public in and for the State of Washington, with principal office in the County of King, residing therein, duly commissioned and sworn, personally appeared Roger Kaltenbach, known to me to be the person whose name is subscribed to the within instrument as the attorney-in-fact of Liberty Mutual Insurance Company as surety in said instrument, and acknowledged to me that he subscribed the name of said corporation thereto as surety, and his own name as attorney-in-fact.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal, at my office in the aforesaid County, the day and year in this certificate first above written.



NOTARY PUBLIC

Deanna M. French
Commission Expires: 04/01/2022

CONTRACTOR'S CERTIFICATION OF PENDING ACTIONS

As part of its bid or proposal (Non-Price Proposal in the case of Design-Build contracts), the Bidder shall provide to the City a list of all instances within the past 10 years where a complaint was filed or pending against the Bidder in a legal or administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers, and a description of the status or resolution of that complaint, including any remedial action taken.

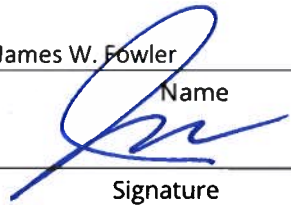
CHECK ONE BOX ONLY.

- The undersigned certifies that within the past 10 years the Bidder has NOT been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers.

- The undersigned certifies that within the past 10 years the Bidder has been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers. A description of the status or resolution of that complaint, including any remedial action taken and the applicable dates is as follows:

DATE OF CLAIM	LOCATION	DESCRIPTION OF CLAIM	LITIGATION (Y/N)	STATUS	RESOLUTION/REMEDIAL ACTION TAKEN

Contractor Name: James W. Fowler Co.

Certified By James W. Fowler Title President
Name

Signature Date June 19, 2019

USE ADDITIONAL FORMS AS NECESSARY

Mandatory Disclosure of Business Interests Form

BIDDER/PROPOSER INFORMATION

Legal Name James W. Fowler Co.	DBA James W. Fowler Co.		
Street Address 12775 Westview Drive	City Dallas	State OR	Zip 97338
Contact Person, Title John B. Fowler, Executive Vice President	Phone (503) 623-5373	Fax (503) 623-9117	

Provide the name, identity, and precise nature of the interest* of all persons who are directly or indirectly involved** in this proposed transaction (SDMC § 21.0103).

* The precise nature of the interest includes:

- the percentage ownership interest in a party to the transaction,
- the percentage ownership interest in any firm, corporation, or partnership that will receive funds from the transaction,
- the value of any financial interest in the transaction,
- any contingent interest in the transaction and the value of such interest should the contingency be satisfied, and
- any philanthropic, scientific, artistic, or property interest in the transaction.

** Directly or indirectly involved means pursuing the transaction by:

- communicating or negotiating with City officers or employees,
- submitting or preparing applications, bids, proposals or other documents for purposes of contracting with the City, or
- directing or supervising the actions of persons engaged in the above activity.

Please see attached JWF Mandatory Disclosure of Business Interests

Name	Title/Position
City and State of Residence	Employer (if different than Bidder/Proposer)
Interest in the transaction	

Name	Title/Position
City and State of Residence	Employer (if different than Bidder/Proposer)
Interest in the transaction	

*** Use Additional Pages if Necessary ***

Under penalty of perjury under the laws of the State of California, I certify that I am responsible for the completeness and accuracy of the responses contained herein, and that all information provided is true, full and complete to the best of my knowledge and belief. I agree to provide written notice to the Mayor or Designee within five (5) business days if, at any time, I learn that any portion of this Mandatory Disclosure of Business Interests Form requires an updated response. Failure to timely provide the Mayor or Designee with written notice is grounds for Contract termination.

James W. Fowler, President		June 19, 2019
Print Name, Title	Signature	Date

Failure to sign and submit this form with the bid/proposal shall make the bid/proposal non-responsive. In the case of an informal solicitation, the contract will not be awarded unless a signed and completed Mandatory Disclosure of Business Interests Form is submitted.



Mandatory Disclosure of Business Interests

Bidder/Proposer Information

Name: Fowler Construction Group, LLC, a Delaware LLC

City and State of Residence: Dallas, Oregon

Interest in the transaction: Fowler Construction Group, LLC owns 100% of James W. Fowler Co.

Name: James W. Fowler, President

City and State of Residence: Dallas, Oregon

Employer: James W. Fowler Co.

Interest in the transaction: Member of Fowler Construction Group, LLC

Name: John B. Fowler, Executive Vice President/Secretary

City and State of Residence: Dallas, Oregon

Employer: James W. Fowler Co.

Interest in the transaction: Member of Fowler Construction Group, LLC

Name: Candace J. Fowler, Treasurer

City and State of Residence: Dallas, Oregon

Employer: James W. Fowler Co.

Interest in the transaction: Member of Fowler Construction Group, LLC

SUBCONTRACTOR LISTING
(OTHER THAN FIRST TIER)

Pursuant to California Senate Bill 96 and in accordance with the requirements of Labor Code sections 1771.1 and 1725.5, by submitting a bid or proposal to the City, Contractor is certifying that he or she has verified that all subcontractors used on this public work project are registered with the California Department of Industrial Relations (DIR). **The Bidder is to list below the name, address, license number, DIR registration number of any (known tiered subcontractor)** - who will perform work, labor, render services or specially fabricate and install a portion [type] of the work or improvement pursuant to the contract. **If none are known at this time, mark the table below with non-applicable (N/A).**

NAME, ADDRESS AND TELEPHONE NUMBER OF SUBCONTRACTOR	CONSTRUCTOR OR DESIGNER	DIR REGISTRATION NUMBER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____				
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____	<div style="border: 2px solid red; padding: 10px; color: red; font-weight: bold;"> Not Applicable </div>			
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____				
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____				

**** USE ADDITIONAL FORMS AS NECESSARY ****

SUBCONTRACTORS ADDITIVE/DEDUCTIVE ALTERNATE

*** FOR USE WHEN LISTING SUBCONTRACTORS ON ALTERNATES ***
 TO BE SUBMITTED WITH OTHER REQUIRED FORMS
 (Use Additional Sheets As Needed)

ALTERNATE A

SUBCONTRACTOR NAME, LOCATION, PHONE & EMAIL	CONSTRUCTOR OR DESIGNER	DIR REGISTRATION NUMBER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOB®	WHERE CERTIFIED	CHECK IF JOINT VENTURE PARTNERSHIP
Name: <u>Bonita Pipeline, Inc.</u> Address: <u>140 N. Glover Avenue</u> City: <u>Chula Vista</u> State: <u>CA</u> Zip: <u>91910</u> Phone: <u>619-434-9801</u> Email: <u>Frank@bonitapipeline.com</u>	Constructor	1000018819	817325	Sewer Improvements	\$129,560	SLBE/ELBE 12BP0740	City of San Diego	
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____								
Name: _____ Address: _____ City: _____ State: _____ Zip: _____ Phone: _____ Email: _____								

- ① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):
- | | | | |
|---|-------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOB | | |
- ② As appropriate, Bidder shall indicate if Subcontractor is certified by:
- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | | |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

SUBCONTRACTORS ADDITIVE/DEDUCTIVE ALTERNATE

*** FOR USE WHEN LISTING SUBCONTRACTORS ON ALTERNATES ***
 TO BE SUBMITTED WITH OTHER REQUIRED FORMS
 (Use Additional Sheets As Needed)

ALTERNATE B

SUBCONTRACTOR NAME, LOCATION, PHONE & EMAIL	CONSTRUCTOR OR DESIGNER	DIR REGISTRATION NUMBER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOB®	WHERE CERTIFIED	CHECK IF JOINT VENTURE PARTNERSHIP
Name: <u>Bonita Pipeline, Inc.</u> Address: <u>140 N. Glover Avenue</u> City: <u>Chula Vista</u> State: <u>CA</u> Zip: <u>91910</u> Phone: <u>619-434-9801</u> Email: <u>Frank@bonitapipeline.com</u>	Constructor	1000018819	817325	Sewer Improvements	\$-18,145	SLBE/ELBE 12BP0740	City of San Diego	
Name: <u>Statewide Stripes, Inc.</u> Address: <u>7330 Mission Gorge Road</u> City: <u>San Diego</u> State: <u>CA</u> Zip: <u>92120</u> Phone: <u>858-560-6887</u> Email: <u>sean@statewidestripes.com</u>	Constructor	1000001334	788286	Striping	\$-9,520	SLBE 10SS0008	City of San Diego	
Name: <u>All American Asphalt</u> Address: <u>400 East 6th Street</u> City: <u>Corona</u> State: <u>CA</u> Zip: <u>92879</u> Phone: <u>951-736-7600</u> Email: <u>afreire@allamericanasphalt.com</u>	Constructor	1000001051	267073	Paving	\$-162,234	N/A	N/A	

- ① As appropriate, Bidder shall identify Subcontractor as one of the following and shall include a valid proof of certification (except for OBE, SLBE and ELBE):
- | | | | |
|---|-------|--|---------|
| Certified Minority Business Enterprise | MBE | Certified Woman Business Enterprise | WBE |
| Certified Disadvantaged Business Enterprise | DBE | Certified Disabled Veteran Business Enterprise | DVBE |
| Other Business Enterprise | OBE | Certified Emerging Local Business Enterprise | ELBE |
| Certified Small Local Business Enterprise | SLBE | Small Disadvantaged Business | SDB |
| Woman-Owned Small Business | WoSB | HUBZone Business | HUBZone |
| Service-Disabled Veteran Owned Small Business | SDVOB | | |
- ② As appropriate, Bidder shall indicate if Subcontractor is certified by:
- | | | | |
|--|--------|--|----------|
| City of San Diego | CITY | State of California Department of Transportation | CALTRANS |
| California Public Utilities Commission | CPUC | | |
| State of California's Department of General Services | CADoGS | City of Los Angeles | LA |
| State of California | CA | U.S. Small Business Administration | SBA |

The Bidder will not receive any subcontracting participation percentages if the Bidder fails to submit the required proof of certification.

COMMITMENT TO COMPLY WITH SKILLED AND TRAINED WORKFORCE REQUIREMENTS

Bidder, on behalf of itself and its subcontractor(s) at every tier, hereby commits that a skilled and trained workforce will be used to perform all work on the Project that falls within an apprenticeship occupation in the building or construction trades in accordance with Chapter 2.9 (commencing with Section 2600) of Part 1 of Division 2 of the Public Contract Code. Pursuant to Public Contract Code section 2601, as of January 1, 2018:

“Skilled and trained workforce” means a workforce that meets all of the following conditions: All the workers performing work in an apprenticeable occupation in the building and construction trades are either skilled journeypersons or apprentices registered in an apprenticeship program approved by the chief.

For work performed on or after January 1, 2018, at least 40 percent of the skilled journeypersons employed to perform work on the contract or project by every contractor and each of its subcontractors at every tier are graduates of an apprenticeship program for the applicable occupation. This requirement shall not apply to work performed in the following occupations: acoustical installer, bricklayer, carpenter, cement mason, drywall installer or lather, marble mason, finisher, or setter, modular furniture or systems installer, operating engineer, pile driver, plasterer, roofer or waterproofer, stone mason, surveyor, teamster, terrazzo worker or finisher, and tile layer, setter, or finisher.

For work performed on or after January 1, 2019, at least 50 percent of the skilled journeypersons employed to perform work on the contract or project by every contractor and each of its subcontractors at every tier are graduates of an apprenticeship program for the applicable occupation. This requirement shall not apply to work performed in the following occupations: acoustical installer, bricklayer, carpenter, cement mason, drywall installer or lather, marble mason, finisher, or setter, modular furniture or systems installer, operating engineer, pile driver, plasterer, roofer or waterproofer, stone mason, surveyor, teamster, terrazzo worker or finisher, and tile layer, setter, or finisher.

For work performed on or after January 1, 2020, at least 60 percent of the skilled journeypersons employed to perform work on the contract or project by every contractor and each of its subcontractors at every tier are graduates of an apprenticeship program for the applicable occupation. This requirement shall not apply to work performed in the following occupations: acoustical installer, bricklayer, carpenter, cement mason, drywall installer or lather, marble mason, finisher, or setter, modular furniture or systems installer, operating engineer, pile driver, plasterer, roofer or waterproofer, stone mason, surveyor, teamster, terrazzo worker or finisher, and tile layer, setter, or finisher.

NOTE: The above commitment is required by California Public Utilities Code section 132354.7 and must be submitted by Bidder in order for the Bid to be responsive.

Name of Bidder: _____

Name and Title of Bidder’s Authorized Representative: _____

Signature of Bidder’s Representative: _____ Date: _____

(SIGN HERE)

Insert Company Letterhead

Skilled and Trained Workforce Certification Form

Month: _____ Year: _____

In accordance with Public Utilities Code section 132354.7 and Public Contract Code sections 2600-2602, _____ (the "Prime Contractor") certifies that all the workers performing

(Prime Contractor Name)

work in an apprenticeable occupation utilized on the project known as _____ (the "Project") during this monthly reporting period are either skilled

(Project Name)

journeypersons or apprentices registered in an apprenticeship program approved by the Chief of the Division of Apprenticeship Standards of the California Department of Industrial Relations (the "Chief").

"Skilled journeyperson" means a worker who either:

- (1) Graduated from an apprenticeship program for the applicable occupation that was approved by the Chief or apprenticeship program located outside California and approved for federal purposes, pursuant to the apprenticeship regulations adopted by the Federal Secretary of Labor.
- (2) Has at least as many hours of on-the-job experience in the applicable occupation as would be required to graduate from an apprenticeship program that is approved by the Chief.

In addition, the Prime Contractor certifies that it has met the requirements of Public Contract Code 2601(d), subject to certain exceptions set forth therein, that the required percentage of the skilled journeypersons or skilled journeyperson hours employed to perform work on the Project by the Prime Contractor and all subcontractors are graduates of an apprenticeship program for the applicable apprenticeable occupation¹.

A graduate of an apprenticeship program means either of the following:

- (1) An individual that has been issued a certificate of completion under the authority of the California Apprenticeship Council for completing an apprenticeship program approved by the Chief pursuant to Section 3075 of the Labor Code, or
- (2) An individual that has completed an apprenticeship program located outside California and approved for federal purposes pursuant to the apprenticeship regulations adopted by the federal Secretary of Labor.

I declare, under penalty of perjury under the laws of the State of California, that the foregoing is true and correct. I certify that the attached Skilled and Trained Workforce Monthly Compliance Reports are complete and accurate.

Full Name: _____

Title: _____

Signature: _____ Date Signed: _____

Please upload the completed form to the Labor Compliance Monitoring System (LCMS) monthly.

Insert contractor name/letterhead here

Skilled and Trained Workforce Monthly Compliance Report

DIRECTIONS: This form is required to be submitted by the Prime for all contractors regardless of tier by the 15th of the following month for work performed corresponding to this reporting period. Items with a red asterisk (*) indicate a required field.

Project Title *	<input type="text"/>		
Project Number *	<input type="text"/>		
Prime Contractor *	<input type="text"/>		
Subcontractor *	<input type="text"/>		
Contact Name *	<input type="text"/>		
Contact Number *	<input type="text"/>		
Work Month & Year *	Month	Year	
	<input type="text"/>	<input type="text"/>	
Exemptions *	The contractor or subcontractor need not meet the apprenticeship graduation requirements if either (1) is true, or (2)(A) and (2)(B) are both true:	Please select * (True/False)	Exempt or non-exempt?
	(1) The contractor or subcontractor employed skilled journeypersons to perform fewer than 10 hours of work on the project during this reporting period?	<input type="text"/>	Exempt if (1) is "True".
	(2) (A) The subcontractor was not a listed subcontractor under Section 4104 or a substitute for a listed subcontractor. (2) (B) The subcontract does not exceed one-half of 1 percent of the price of the prime contract.	<input type="text"/>	Exempt if both (2)(A) and (2)(B) are "True".

Report * Please fill out the following report for all apprenticeable occupations utilized in this reporting period.

SKILLED JOURNEYPerson (SJ) REPORT							
Apprenticeable Occupation (use dropdown menu) *	Required minimum SJ: Apprentice Graduate percentage (see 2nd page attachment) *	Number of Skilled Journeypersons (SJ) employed by the contractor to perform work on the project		SJ ratio between the number of SJ: Apprentice Graduates to SJ: On-The-Job Experience workers	Number of hours worked by SJ employed by the contractor to perform work on the project		SJ ratio of hours worked by SJ: Apprentice Graduates compared with SJ: On-The-Job Experience workers
		SJ: Apprentice Graduate *	SJ: On-The-Job Experience *		SJ: Apprentice Graduate *	SJ: On-The-Job Experience *	
EXAMPLE Laborer	40%	7	3	70%	30	70	30%

Terms	Definitions
Apprentice	Defined in Labor Code 3077
Skilled Journeyperson: Apprentice Graduate	Defined in Public Contracts Code 2601 (e) (1)
Skilled Journeyperson: On-The-Job Experience	Defined in Public Contracts Code 2601 (e) (2)

Apprenticeable Occupations (San Diego County)	Annual Apprenticeship Graduation Rate Minimum Requirements for Employed Skilled Journeypersons (%)		
	January 1 2018	January 1 2019	January 1 2020
Asbestos Worker, Heat and Frost Insulator	40	50	60
Boilermaker - Blacksmith	40	50	60
Bricklayer	30	30	30
Bricktender	40	50	60
Bridge Carpenter	30	30	30
Building Construction Inspector and Field Soils and Material Tester	30	30	30
Carpenter	30	30	30
Carpet, Linoleum and Resilient Floor Layer	40	50	60
Cement Mason	30	30	30
Drywall Finisher	40	50	60
Drywall Installer/Lather (Carpenter)	30	30	30
Electrician: Inside Wireman	40	50	60
Electrician: Sound and Signal Technician	40	50	60
Electrical Utility Lineman	40	50	60
Elevator Constructor	40	50	60
Field Surveyor: Chainman/Rodman	30	30	30
Field Surveyor: Chief of Party	30	30	30
Glazier	40	50	60
Horizontal Directional Drilling (Laborer)	40	50	60
Ironworker	40	50	60
Laborer	40	50	60
Landscape/Irrigation Fitter	40	50	60
Landscape/Irrigation Laborer	40	50	60
Marble Finisher	30	30	30
Metal Roofing Systems Installer	40	50	60
Millwright	40	50	60
Modular Furniture Installer (Carpenter)	30	30	30
Operating Engineer	30	30	30
Operating Engineer: Dredger	30	30	30
Operating Engineer: Landscape Construction	30	30	30
Painter	40	50	60
Painter: Industrial Painter	40	50	60
Parking and Highway Improvement (Striper-Laborer)	40	50	60
Pile Driver (Carpenter)	30	30	30
Plasterer	30	30	30
Plaster Tender	40	50	60
Plumber, Pipefitter, Steamfitter	40	50	60
Roofer	30	30	30
Sheet Metal Worker	40	50	60
Sprinkler Fitter (Fire Protection/Fire Control Systems)	40	50	60
Stator Rewinder	40	50	60
Terrazzo Finisher (Carpenter)	30	30	30
Terrazzo Installer (Carpenter)	30	30	30
Terrazzo Finisher	30	30	30
Terrazzo Worker	30	30	30
Tile Finisher	30	30	30
Tile Layer	30	30	30

Please visit the California Legislative Information website for further information on Public Contracts Code (PCC) 2600-2602, <https://leginfo.ca.gov/>.

City of San Diego

CITY CONTACT: Brittany Friedenreich, Senior Contract Specialist, Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM A1



FOR

MONTEZUMA PPL/MID-CITY PIPELINE PH2 AND 70TH-ALVARADO TO SARANAC-SIDEWALK

BID NO.: K-19-1821-DBB-3
SAP NO. (WBS/IO/CC): S-11026, B-17065
CLIENT DEPARTMENT: 2000, 2116
COUNCIL DISTRICT: 7, 9
PROJECT TYPE: KA, IK

BID DUE DATE:

**2:00 PM
MAY 22, 2019**

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ON THE COVER PAGE.**

James Nagelvoort, Director
Public Works Department

Dated: *April 23, 2019*
San Diego, California

JN/RWB/cc

City of San Diego

CITY CONTACT: Brittany Friedenreich, Senior Contract Specialist, Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM A2



FOR

MONTEZUMA PPL/MID-CITY PIPELINE PH2 AND 70TH -ALVARADO TO SARANAC-SIDEWALK

BID NO.: K-19-1821-DBB-3
SAP NO. (WBS/IO/CC): S-11026, B-17065
CLIENT DEPARTMENT: 2000, 2116
COUNCIL DISTRICT: 7, 9
PROJECT TYPE: KA, IK

BID DUE DATE:

**2:00 PM
MAY 22, 2019**

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:

Eric Magee
Registered Engineer
(Montezuma PPL/Mid-City Pipeline Ph 2)

4/24/19
Date

Seal:



Brian Vitelle
For City Engineer
(Montezuma PPL/Mid-City Pipeline Ph 2)

4/29/19
Date

Seal:



ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



4/22/2019

Seal:

Registered Engineer

Date

For City Engineer (70th-Alvarado to Saranac-Sidewalk)



A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

B. BIDDER'S QUESTIONS

Q1. Section 307 Jacking and Tunneling, is the construction of the Interstate 8 Crossing limited to being performed by microtunneling methods only?

A1. The Contractor is required, per contract requirements, to perform additional probing along the project alignment to confirm the depth to top of Stadium Conglomerate.

The bidders are required to bid the construction of the tunnel crossing per project plan and specification. If favorable conditions can be confirmed later on after the completion of these additional borings, the City, Engineer, and the permitting agencies will consider alternative construction methods.

Q2. Are there any pre-approval memorandums indicating Continuous Maximum Allowable Discharge to City Sewers for Groundwater?

Please consider adding a line item to the bid for Testing, Sampling, Site Storage, Handling, Transportation, and Disposal of Non-RCRA Hazardous Waste Contamination from the Treatment of Contaminated Ground Water.

A2. See below addition for the new bid item in **Section K** of this Addendum.

Q3. Please clarify what type of material shall be used for the 6" bypass butterfly valve as well as the material beyond that (for the 6" blow off and 6" AVAR) shown on detail 2 on drawing C-11.

A3. The materials for the bypass, blowoff, and AVAR are as follows:

- **Bypass:** CMLTC Pipe
- **AVAR:** Material per SDW-144/SDW-160
- **Blowoff:** CMLTC Pipe

Q4. Does this project have any domestic materials requirement?

A4. Please refer to 2018 Whitebook Section 4-3. There is no domestic material requirement. However, all parts of production shall be performed or produced in the United States per Whitebook 4-3.1 item 5. Additionally, any material, fabricated products, or equipment from sources more than 200 miles outside the limits of the city must be inspected by City Lab Staff or a qualified inspection agency approved by the Engineer, per Whitebook 4-3.3.

Q5. Subject: Precedence of Documents – “Technical”
Specification: Whitebook 3-7.2

City Whitebook Section 3-7.2.1 does not address “Technical” as certain specifications are referenced in the Project Bidding Documents. We have noted that Technicals follow a page in the Bid Documents stating “END OF SUPPLEMENTARY SPECIAL PROVISIONS (SSP): (pdf page 76). Please clarify the Order of Precedence for Technicals in the Bidding Documents.

A5. Technicals are at the same level of precedence as the SSP and shall be considered part of Attachment E.

Q6. Subject: Self Performance Requirements
Specification: Attach E – SSP 3-2

Attachment E – Supplementary Special Provisions, Section 3-2 Paragraph 1 states: “You shall perform, with your own organization, Contract Work amounting to at least 50% of the base Bid AND 50% of any alternates”. For this project, Alternates A and B largely consist of work items traditionally completed by subcontractors, as well as items providing an opportunity for Prime Bidders to utilize ELBE and SLBE subcontractors.

We respectfully request the requirement to self-perform 50% of alternates be waived for this project.

A6. Please see revised language in **Section D** of this Addendum.

- Q7. Subject: Reference Standards
Specification: Instructions to Bidders, Section 8

In the Instruction to Bidders, Section 8, the Bid Documents advise the work will be completed in accordance with 2018 Editions of the Greenbook and CALTRANS standards. Notes on Plan Sheet G-4 reference the 2015 Edition of the Greenbook, and 2002 Edition of CALTRANS standards. Please confirm the 2018 standards as described in the Instruction to Bidders will govern the proposed work on this project.

- A7. This work shall be performed in accordance with the 2018 Editions and Caltrans standards as shown in Section 8 of the Instructions to Bidders.
- Q8. Please advise if the City has identified acceptable staging areas for equipment and material for this project. Since much of the work occurs at night, identifying acceptable staging areas is proving extremely difficult during the current bid time frame. Is an area available at the Alvarado Treatment Plant that bidders can rely on using for bidding purposes?
- A8. No staging area at the Alvarado Treatment Plant has been dedicated to this project. Contractor cannot stage on Kiowa Drive. Contractor is responsible to identify staging area by looking at different options.
- Q9. In Specification Section 02443 2.1.B.2, it states: "Casing pipe shall be a direct-jacked, non-pressure welded steel pipe, with "Permalok" joints specifically designed for pipe jacking." In a recent change, District 11 of CalTrans has denied the use of Permalok on a project in San Diego County. Can the City confirm that CalTrans has approved the use of Permalok joints for this project?
- A9. The joints are required to be welded.

Q10. In the Supplementary Special Provisions, Section 307-2, part h), it provides options for methods of tunneling:

“The excavation and the installation of the steel casing may be performed by:

- i. Microtunnel – Per Specification Section 02443 requirements (See the attached Technical Specification Sections).
- ii. Pipe Jacking with appropriate mechanical excavation tools or by hand with man access inside the pipe jacking pipe – Per section 307-2.1 of SSPWC.

However, in Specification Section 02443 1.1.A, it states:

“This Section specifies minimum design and performance requirements for the construction of the Mid City pipeline at the I-8 crossing by two-pass microtunneling method, where a steel casing pipe will be installed first and the final carrier pipe to be inserted later.”

These two specification Sections conflict each other. Please clarify whether microtunneling is the only allowable trenchless method for the I-8 Crossing, as stated in Specification 02443.

A10. Microtunneling is required for I-8 crossing and Pipe Jacking is specified for San Diego County Water Authority crossing.

C. ATTACHMENTS

1. To Attachment A, Scope of Work, Item 3, Contract Time, Subsection 3.1, page 26, **DELETE** in its entirety and **SUBSTITUTE** with the following:

3.1 INTERIM MILESTONES The following table is provided to the Contractor to adhere to work duration headlines. The intent is to set a maximum number of working days for each segment to minimize disruptions for City of San Diego and City of La Mesa’s residents. In the total estimated **640 Working Days**, several segments within the Plans numbered **37333-D** of the project are expected to be constructed concurrently with one another. If the proposed working days in conjunction with the working hours do

not fit within the Contractor's scheduling means, submit a proposed schedule to the Construction Manager for review and approval. After approval, if the contractor cannot meet the agreed upon duration for these specific milestones, Contractor shall pay liquidated damages as defined in Section 6-9 in the Supplementary Special Provisions (SSP).

From	To	Segment	Duration (Working Days)
9+20	19+00	Mohawk to 70 th St. at Saranac St	75
19+00	29+45	70 th St at Saranac to Manway #2	82
29+45	30+73	Manway #2 to Launch Pit	7
30+73	38+10	Micro tunnel	200
38+02	38+22	Receiving pit at Lake Murray BI (LMB)	100
38+22	38+89	Receiving pit to Manway #3	20
38+89	45+98	LMB and SDCWA Pipe Crossing	100
45+98	57+95	LMB to Alvarado WTP valve vault	70
		Helix Water District 8" waterline replacement	15
		City of La Mesa 8" sewer main replacement	15
		Paving, Striping, median work, misc.	170

D. SUPPLEMENTARY SPECIAL PROVISIONS

1. To Section 1, General, Terms, Definitions, Abbreviations, Units of Measure, and Symbols, sub-section 1-2, Terms and Definitions, page 37, **ADD** the following:

To the "WHITEBOOK", ITEM 43, DELETE in its entirety and SUBSTITUTE with the following:

43. **Field Order** – A Field Order is a written agreement by the Engineer to compensate you for Work items in accordance with 2-8, "EXTRA WORK" or 2-9, "CHANGED CONDITIONS". A Field Order does not change the Contract Price, Contract time, or the scope intent of the Contract.

2. To Section 3, Control of Work, sub-section 3-2, Self-Performance, page 38, **DELETE** in its entirety and **SUBSTITUTE** with the following:

3-2 SELF PERFORMANCE. To the "GREENBOOK", DELETE in its entirety and SUBSTITUTE with the following:

1. You shall perform, with your own organization, Contract Work amounting to at least 50% of the base Bid **INCLUDING** 50% of any alternates.

3. To Section 6, Prosecution and Progress of the Work, **ADD** the following:

6-2.2 Work Restrictions. To the "WHITEBOOK", ADD the following:

The items below are in reference to the Montezuma PPL/Mid-City Pipeline Ph2 Drawings **37333-D**:

1. Trenchless Tunnel Construction under 108" SDCWA Pipeline Crossing – at the end of the work shift, the site shall be cleared of all equipment. Traffic rated shaft plates, designed for H-20 loading, shall be placed over both the launch and receiving shafts, such that the road shall be opened to through traffic during the day.
2. Trenchless Tunnel Construction under Interstate 8 Crossing – at the end of the work shift, the site shall be cleared of all equipment. Traffic rated shaft plates, designed for H-20 loading, shall be placed over the

receiving shaft on Lake Murray Blvd, such that the road can be opened to through traffic during the day.

6-9 LIQUIDATED DAMAGES. To the “WHITEBOOK”, ADD the following:

3. The OWNER and CONTRACTOR recognize that time is of the essence of this agreement and that the owner will suffer financial loss if the WORK is not completed within the time specified. They also recognize the delays, expense, and difficulties in proving legal proceedings the actual loss suffered by the OWNER and the CONTRACTOR agree that as liquidated damages for delays (but not as a penalty) the CONTRACTOR shall pay the said amount for everyday that expires in excess of the time specified for each milestone completion of the WORK, as described in Attachment A – Scope of Work, section 3 CONTRACT TIME.

4. To Section 7, Measurement and Payment, **ADD** the following:

7-3.9 Field Orders. To the “WHITEBOOK”, DELETE in its entirety and SUBSTITUTE with the following:

1. If the cumulative total of Field Order items of Work does not exceed the “Field Orders” Bid Item, the City shall pay those Field Orders as shown below:

**TABLE 7-3.9
FIELD ORDER LIMITS**

Contract Price	Maximum Field Order Work Amount
Less than \$100,001	\$2,500
\$100,001 to \$1,000,000	\$5,000
\$1,000,001 to \$5,000,000	\$10,000
\$5,000,001 to \$15,000,000	\$20,000
\$15,000,001 to \$30,000,000	\$40,000
Greater than \$30,000,000	\$50,000

2. Field Order items of Work for contracts greater than \$15,000,000 will require additional approvals from the City prior to its approval by the Resident Engineer.

3. The City will issue a Field Order only after the City's acceptance of the cost of the field order amount.
4. Field Orders shall not be used to add scope or to include extensions of time related to changes in work.
5. If in the event there is a change related to the critical path on the project which necessitates an extension of time and the change amount is within the Field Order limits shown on Table 7-3.9, then a Field Order can be issued to compensate you for the approved costs. Any extensions of time associated with the change shall be included in a subsequent Change Order and no additional compensation shall be granted as part of the change order for the extension of time.
6. The unused portions of Field Orders Bid item shall revert to the City upon Acceptance.

5. To Section 402, Utilities, **ADD** the following:

402-6 COOPERATION. To the "GREENBOOK", ADD the following:

2. Contractor shall coordinate with SDG&E for relocation of utility gas lines at 70th St. and Lake Murray Blvd, and ensure the relocation of utilities before the construction of the 66-inch pipeline. Contractor shall consider and include SDG&E's work and schedule into their proposed schedule.

6. To Section 901, High-Lining Installation, **ADD** the following:

901-2.5 Payment. To the "WHITEBOOK", ADD the following:

4. All work associated with the connection at the Alvarado Treatment Plant, including connection to the existing Vault No. 3 from 72" x 66" Reducer to Station 57+95 and the access hatch modifications shall be paid under the bid item for "Connection to Existing Vault No. 3".

E. ADDITIONAL CHANGES

- The following are additional changes to the Line Items in the PlanetBids Tab:

For clarity where applicable, **ADDITIONS**, if any, have been **Underlined** and **DELETIONS**, if any, have been **~~Stricken out.~~**

Section	Item Code	Description	UoM	Quantity	Payment Reference	Unit Price
Main Bid	561612 <u>S</u>	Denny's Security Guard (EOC Type I)	DAYS <u>AL</u>	300 <u>1</u>	7-3.1	<u>\$84,000</u>
<u>Main Bid</u>	<u>238990</u>	<u>Testing, Sampling, Site Storage, Handling, Transportation, and Disposal of Non-RCRA Hazardous Waste Contamination from the Treatment of Contaminated Ground Water</u>	<u>GAL</u>	<u>500</u>	<u>5-15.17</u>	
Main Bid	237110	Connections to the Existing System by Contractor (66 Inch)	EA	2 <u>1</u>	901-2.5	
<u>Main Bid</u>	<u>237110</u>	<u>Connection to Existing Valve Vault No. 3</u>	<u>EA</u>	<u>1</u>	<u>901-2.5</u>	

F. PLANS

1. To Drawing sheets 40522-01-D, 40522-03-D through 40522-04-D, **DELETE** in their entirety and **REPLACE** with the pages 14 through 16 of this addendum.
2. To Drawing sheet 37333-01-D (Sheet G-1) **DELETE** in its entirety and **REPLACE** with page 17 of this Addendum.
3. To Drawing sheet 37333-04-D (Sheet G-4) **DELETE** in its entirety and **REPLACE** with page 18 of this Addendum.
4. To Drawing sheet 37333-70-D (Sheet CP-1) **DELETE** in its entirety and **REPLACE** with page 19 of this Addendum.
5. To Drawing sheet 37333-72-D (Sheet CP-3) **DELETE** in its entirety and **REPLACE** with page 20 of this Addendum.

James Nagelvoort, Director
Public Works Department

Dated: *May 10, 2019*
San Diego, California

JN/RWB/cc

70TH ALVARADO TO SARANAC SIDEWALK

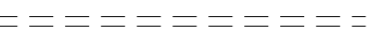

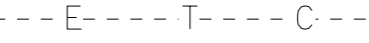

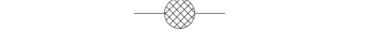








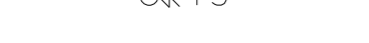





CONTRACTOR'S RESPONSIBILITIES

- PURSUANT TO SECTION 4216 OF THE CALIFORNIA GOVERNMENT CODE, AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION, YOU MUST CONTACT THE REGIONAL NOTIFICATION CENTER (E.G., UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA) AND OBTAIN AN INQUIRY IDENTIFICATION NUMBER.
- NOTIFY SDG&E AT LEAST 10 WORKING DAYS PRIOR TO EXCAVATING WITHIN 10' OF SDG&E UNDERGROUND HIGH VOLTAGE TRANSMISSION POWER LINES. (I.E., 69 KV & HIGHER)
- THE LOCATIONS OF EXISTING BUILDINGS AS SHOWN ON THE PLAN ARE APPROXIMATE.
- REFER TO THE CITY'S APPROVED MATERIALS LIST FOR DETECTABLE WARNING TILES PRODUCT.
- PROTECT AND KEEP ALL HISTORIC STAMPS WITHIN SIDEWALKS PER STANDARD DRAWING SDG-I15.
- THE CONSTRUCTION OF THE CURB RAMP SHALL NOT AFFECT THE DRAINAGE PATTERN OF THE STREET.
- COUNTER SLOPES (CURB RAMP SLOPE PLUS STREET SLOPE) WHEN ADDED CANNOT EXCEED 13%, WITH THE EXCEPTION OF A TYPE C2 AND C1, ADJUST THE SLOPE OF THE MAIN RAMP AND/OR STREET IF THE COUNTER SLOPE EXCEEDS 5.0%.

CONSTRUCTION STORM WATER PROTECTION NOTES

- TOTAL SITE DISTURBANCE AREA (ACRES) 0.09 AC
HYDROLOGIC UNIT / WATERSHED SAN DIEGO/SAN DIEGO RIVER
HYDROLOGIC SUBAREA MISSION SAN DIEGO-907.11
- THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE
 - WPCP
THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NO. R9-2013-0001 AS AMENDED BY R9-2015-0001 AND R9-2015-0100
 - SWPPP
THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NO. R9-2013-0001 AS AMENDED BY R9-2015-0001 AND R9-2015-0100 AND CONSTRUCTION GENERAL PERMIT ORDER 2009-0009-DWQ AS AMENDED BY ORDER 2010-0014-DWQ AND 2012-0006-DWQ
TRADITIONAL: RISK LEVEL 1 2 3 4
LUP: RISK TYPE 1 2 3 4
- CONSTRUCTION SITE PRIORITY
 - ASBS HIGH MEDIUM LOW

EXISTING STRUCTURES

- EX DRAINS 
- EX ELECTRIC 
- EX ELEC. COND., TEL. COND., CATV 
- EX ELECTRIC VAULT/ TRANSFORMER 
- EX ELECTRIC POLE 
- EX GAS MAIN 
- EX GAS VALVE 
- EX GROUND LINE (PROFILE) 
- EX PAVEMENT (PROFILE) 
- EX SEWER MANHOLE 
- EX STREET LIGHT 
- EX STREET SIGN 
- EX TELE. PEDESTAL 
- EX TRAFFIC SIGNAL 
- EX WATER 
- EX WATER METER 
- EX WATER VALVE 
- EX SURVEY CONTROL 
- EX CONCRETE CHANNEL 

SHEET INDEX

SHEET NO.	DISCIPLINE CODE	TITLE	LIMITS
1	G-01	COVER SHEET	
2	D-01	DEMOLITION PLAN	
3	C-01	IMPROVEMENT PLAN	
4	C-02	IMPROVEMENT PLAN	
5	C-03	CURB RAMP DETAILS	
6	C-04	BMP FOR STD DEVELOPMENT PROJECT	
7	C-05	SIGNING AND STRIPING PLAN	

STREET CLASSIFICATION

STREET NAME: 70TH ST
OTHER PRINCIPAL ARTERIAL, ADT=30,530

DISCIPLINE CODE

- G GENERAL
- D DEMOLITION
- C CIVIL

REFERENCE:

THOMAS BROTHER: I270-E4
SEWER: N/A
WATER: N/A
STORM DRAIN: N/A
ATT: N/A
SDG: N/A

FIELD DATA

BENCHMARK: NWP SARANAC ST. AND MANCHESTER RD. (PT. 202),
ELEV.=475.999 MSL, BASED ON NGVD 29 FT AS SHOWN IN
THE CITY OF SAN DIEGO BENCH BOOK

FIELD NOTES:

BASIS OF BEARINGS / COORDINATES:
THE BASIS OF BEARINGS FOR THIS PROJECT WAS DERIVED FROM A PREVIOUS STATIC GPS SURVEY USING R. OF S. I4492 NAD 83 FT, ZONE 6 (EPOCH 1991.35) UTILIZING RTK/GPS FIELD PROCEDURES WITH A CALVRS BASE STATION BROADCAST OF 2017 AND CONSTRAINING TO GPS I69, AND GPS I7, I.E. N41° 02'31"W

REFERENCES:

CITY OF SAN DIEGO PRELIMINARY SURVEY FIELD NOTES:
MID CITY PIPELINE PH 2, 07/10/2013, D. WATKINS, 218-1752, WBS: S-I1026
SUBDIVISION MAPS: 346, 348, 2299, 3318, 8171, I5297
RECORD OF SURVEYS: 3883, 6173, I5302, 20394
CITY DRAWINGS: 2994-B, 8852-B, I4222-L, I4223-DL
PARCEL MAPS: 2344, 6558
CALTRANS MAP: L.O. I4566

MONUMENTATIONSURVEY NOTES

THIS MAP WAS CREATED FROM A PARCEL LAYER AND DOES NOT DEPICT THE ACTUAL LOCATION OF THE PROPERTY LINES. NO BOUNDARY ANALYSIS WAS PERFORMED. THE SURVEY MONUMENTS HAVE BEEN LOCATED BY SURVEY GRADE MEASUREMENTS, AND ARE SHOWN FOR INFORMATIONAL PURPOSES ONLY.

THE CITY OF SAN DIEGO LAND SURVEYORS SHALL REPLACE SUCH MONUMENTS WITH APPROPRIATE MONUMENTS, WHEN SETTING SURVEY MONUMENTS USED FOR RE-ESTABLISHMENT OF THE DISTURBED CONTROLLING SURVEY MONUMENTS AS REQUIRED BY SECTIONS 6730.2 AND 8771 OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA, A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILLED WITH THE COUNTY SURVEYOR.

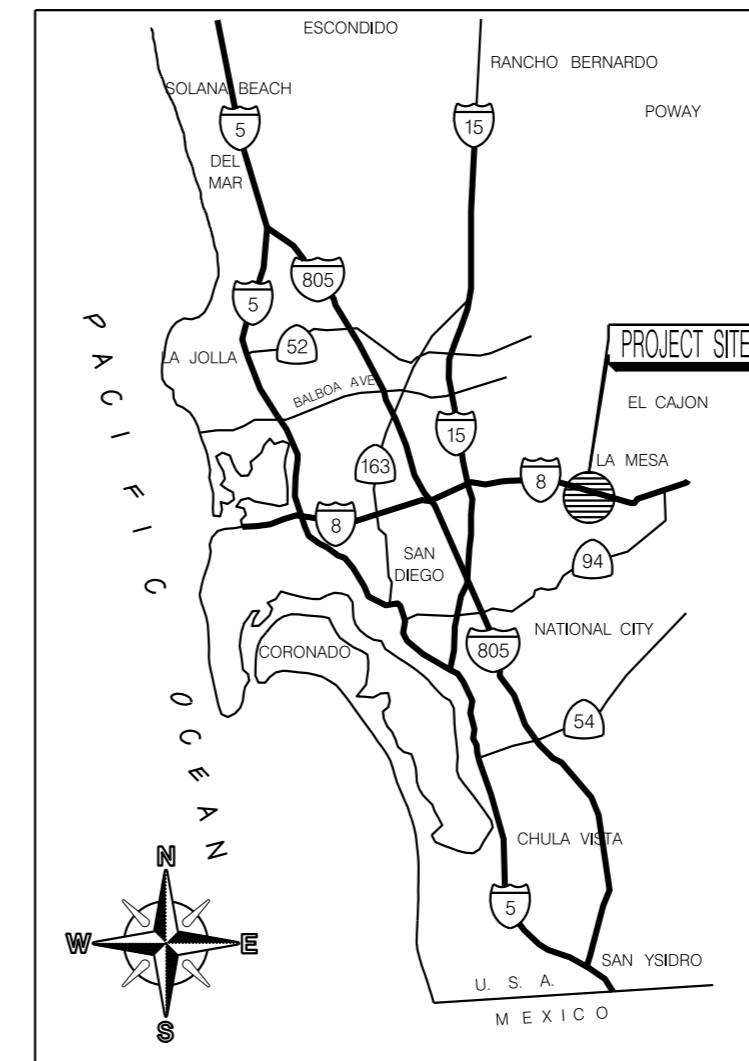
IF ANY HORIZONTAL OR VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE CITY OF SAN DIEGO FIELD SURVEY SECTION SHALL BE NOTIFIED IN WRITING AT LEAST 7 DAYS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPLACING ANY HORIZONTAL CONTROL AND VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION IF THE CITY OF SAN DIEGO SURVEY SECTION IS NOT NOTIFIED PRIOR TO CONSTRUCTION. THE FILING OF A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE SHALL BE FILED WITH COUNTY SURVEYOR. A COPY OF THE FILED DOCUMENT SHALL BE FURNISHED TO THE CITY OF SAN DIEGO SURVEY SECTION.

LEGEND

- * LOCATION OF EXISTING SURVEY MONUMENT
- △ LOCATION OF EXISTING M-10
- MAP NUMBER

WORK TO BE DONE

THE IMPROVEMENTS CONSIST OF THE FOLLOWING WORK: INSTALLATION OF NEW CONCRETE SIDEWALK, DRIVEWAYS, CURB RAMPS, CURB AND GUTTER, DRAINAGE IMPROVEMENTS, RELOCATION OR ADJUSTMENT OF UTILITIES, SIGNS, MAILBOXES AND BUS STOP IMPROVEMENTS. ALL WORK TO BE DONE ACCORDING TO THE PLANS AND THE STANDARD SPECIFICATIONS AND STANDARD DRAWINGS OF THE CITY OF SAN DIEGO.



VICINITY MAP
NOT TO SCALE

ABBREVIATIONS

- | | | | |
|-----------|---------------------------------------|--------|------------------------|
| AC | ASPHALT CONCRETE | SE | SOUTHEAST |
| BC | BEGINNING OF CURB | STA | STATION |
| BF | BOTTOM OF FOOTING | STD | STANDARD |
| BMP | BETTER MANAGEMENT PRACTICE | ST | STREET |
| C&G | CURB & GUTTER | TC | TOP OF CURB |
| DWT | DETECTABLE WARNING TILES | TCP | TRAFFIC CONTROL PLAN |
| DWY | DRIVEWAY | TEL | TELEPHONE |
| EC | END OF CURB | TW | TOP OF WALL |
| EX, EXIST | EXISTING | U.O.N. | UNLESS OTHERWISE NOTED |
| FL | FLOWLINE | | |
| FS | FINISH SURFACE | | |
| LT | LEFT | | |
| MH | MANHOLE | | |
| MIN | MINIMUM | | |
| MS4 | MUNICIPAL SEPARATE STORM SEWER SYSTEM | | |
| NTS | NOT TO SCALE | | |
| NE | NORTHEAST | | |
| NW | NORTHWEST | | |
| PPB | PEDESTRIAN PUSH BUTTON | | |
| PCC | POINT OF COMPOUND CURVE | | |
| PC | POINT OF CURVATURE | | |
| P.I.P. | PROTECT IN PLACE | | |
| PRC | POINT OF REVERSING CURVE | | |
| PROP | PROPOSED | | |
| PT | POINT OF TANGENCY | | |
| RD | ROAD | | |
| R/W | RIGHT OF WAY | | |
| RT | RIGHT | | |

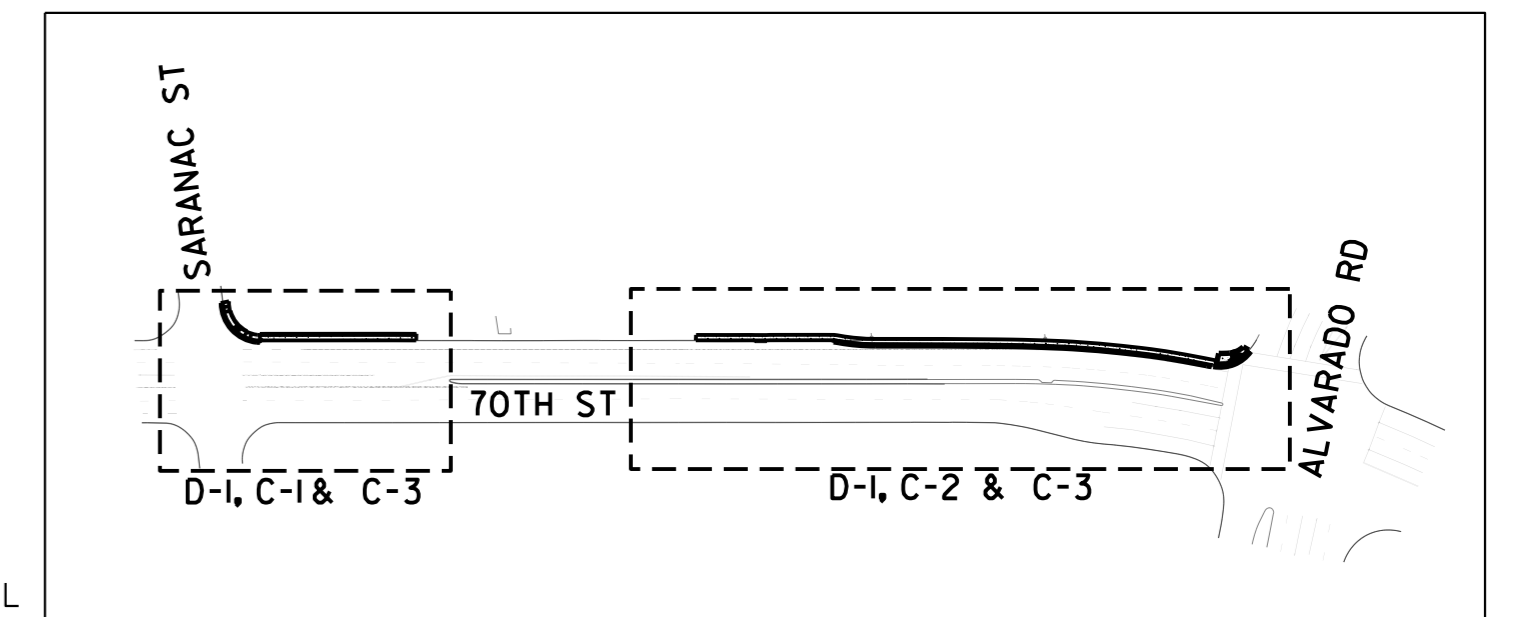
IMPROVEMENTS

- CITY RIGHT OF WAY
- CURB AND GUTTER SDG-I51, TYPE G
- MATCH EXISTING ELEVATION (###)
- PROPOSED FLOWLINE ### FL
- PROPOSED ELEVATION ###
- PROPOSED TOP OF CURB ### TC
- PROPOSED SLOPE 1.5%; 8%
- PEDESTRIAN BARRICADE SDG-I41
- CURB RAMP SDG-I35, TYPE CIMODIFIED
- CHAIN LINK FENCE M-20
- GRAVITY RETAINING WALL
- SIDEWALK SDG-I09, SDG-I55, SDG-I56, G-10

LEGEND

STANDARD DRAWINGS

SYMBOL

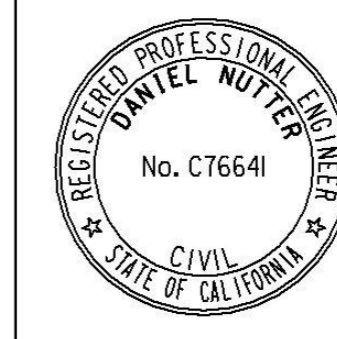


TRAFFIC CONTROL NOTES:

THE CONTRACTOR SHALL, PER SECTION 601-2 OF THE 2015 CITY OF SAN DIEGO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, PREPARE TRAFFIC CONTROL WORKING DRAWINGS AND SUBMIT THEM TO THE RESIDENT ENGINEER. THE WORKING DRAWINGS WILL BE SENT TO THE ENGINEERING TRAFFIC CONTROL SECTION FOR REVIEW AND APPROVAL. THE CONTRACTOR SHALL ALLOW A MINIMUM OF 20 WORKING DAYS FOR REVIEW OF THE WORKING DRAWINGS. UPON APPROVAL OF THE TRAFFIC CONTROL PLAN, THE ENGINEERING TRAFFIC CONTROL SECTION WILL ISSUE A TRAFFIC CONTROL PLAN (TCP) PERMIT. WORK SHALL NOT BEGIN IN THE PUBLIC RIGHT OF WAY WITHOUT THE APPROVED TCP PERMIT.

G-01

70TH ALVARADO TO SARANAC SIDEWALK
COVER SHEET

SPEC. NO. 1821	CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 01 OF 07 SHEETS	WBS B-I7065
APPROVED:  FOR CITY ENGINEER DANIEL NUTTER DEPUTY CITY ENGINEER	DATE 03/15/2019 DATE 76641 RCE#	SUBMITTED BY: HONG LE
ORDERED BY: JOHANNA RIVERA PROJECT ENGINEER	DESCRIPTION	BY
ORIGINAL	HL/JR	APPROVED
ADDENDUM A	HL/JR	DATE 04/18/2019
FILED		
1858444-6316407 CCS83 COORDINATE		
40522-01-D		

CONSTRUCTION CHANGE / ADDENDUM			
CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.
A	4/18/19	3,4	

WARNING
0 1
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

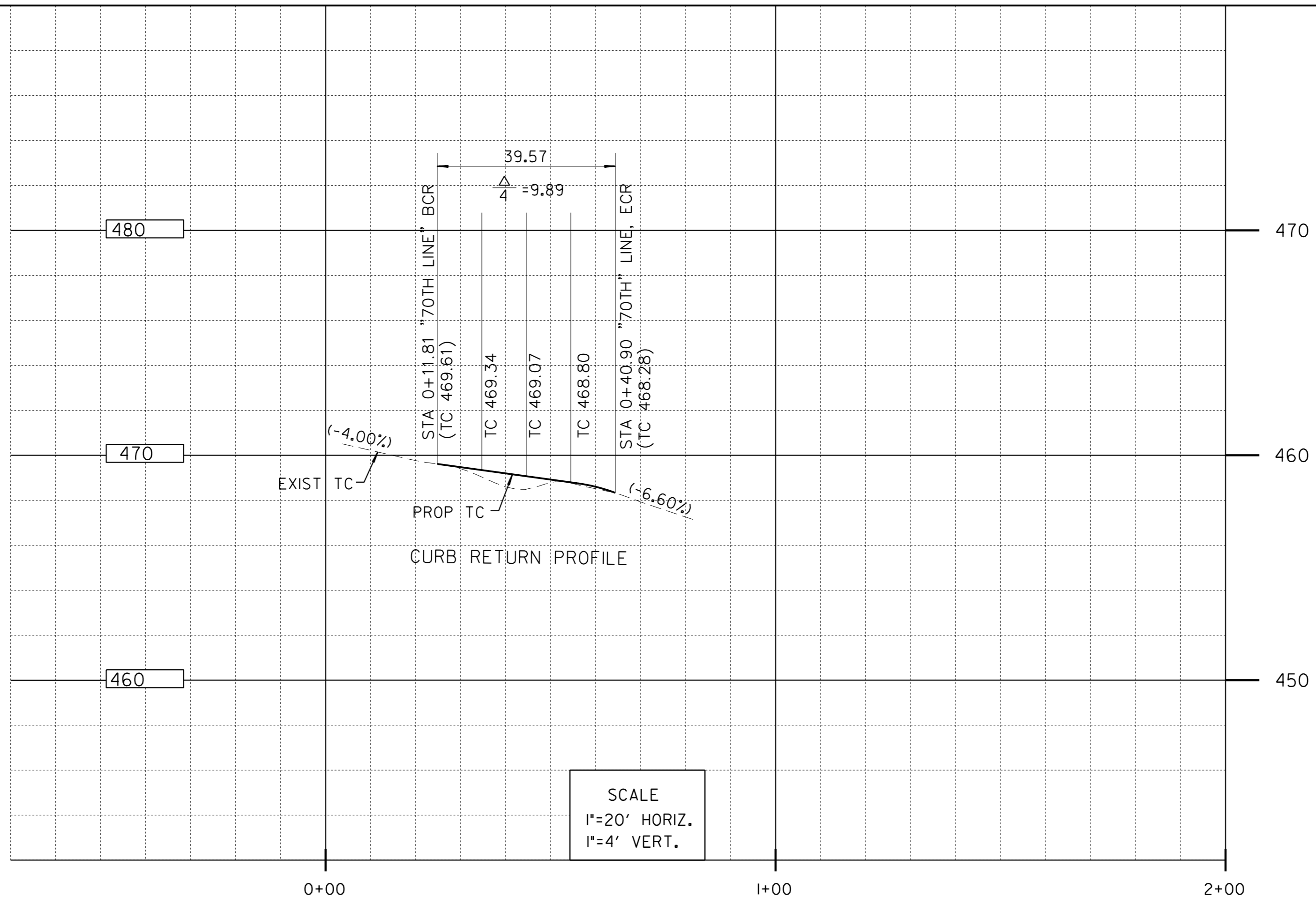
The City of **SAN DIEGO** Public Works

70TH ALVARADO TO SARANAC SIDEWALK

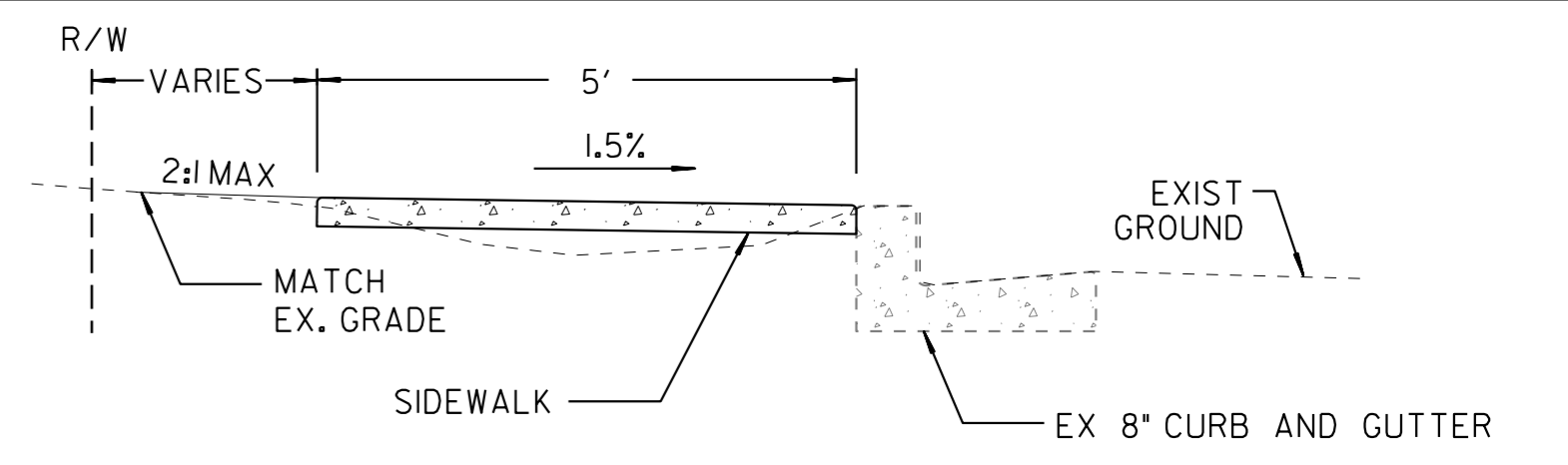
CONSTRUCTION NOTES

- 1 INSTALL PCC SIDEWALK PER SDG-155 AND SDG-109
- 2 INSTALL TYPE A GRAVITY RETAINING WALL PER C-9 & C-10
- 3 INSTALL TYPE G CURB AND GUTTER PER SDG-151
- 4 INSTALL TYPE CI CURB RAMP PER SDG-135
- 5 PROTECT IN PLACE
- 6 IMPROVEMENTS TO BE CONSTRUCTED BY THE MONTEZUMA PPL/MID-CITY PIPELINE PH2 PROJECT

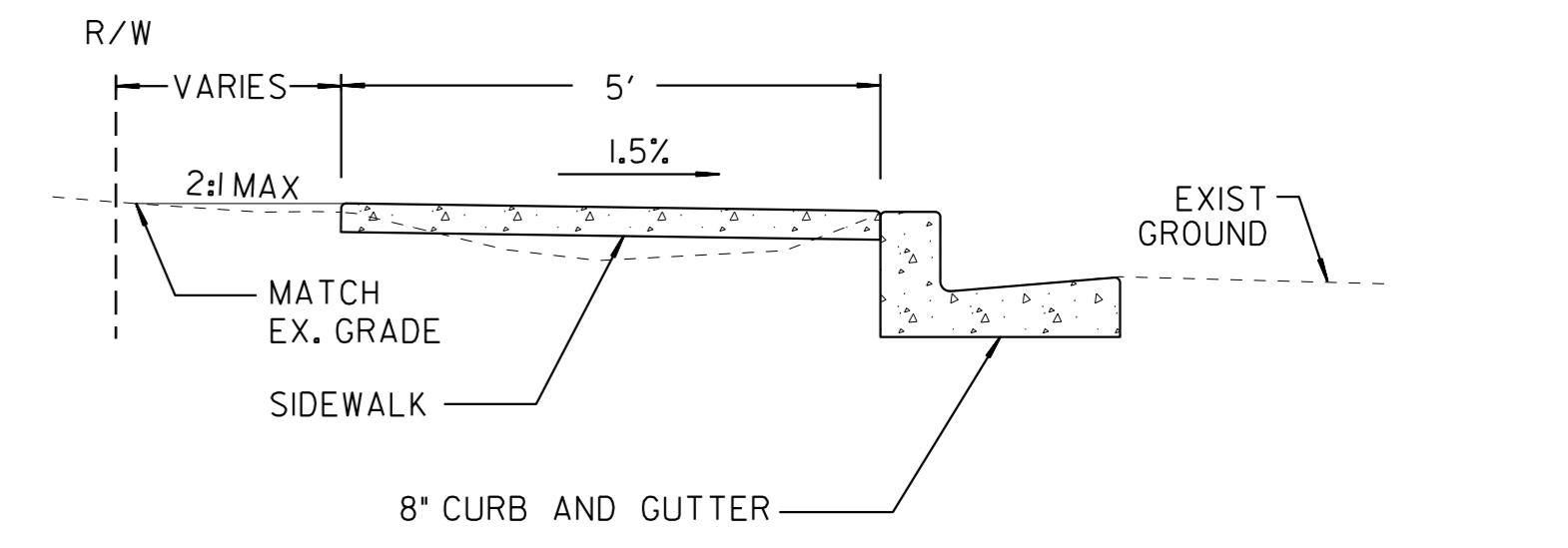
CURB DATA TABLE			
DELTA/BEARING	RADIUS	LENGTH	REMARKS
75° 2'53"	30	39.57	8" TALL CURB AND GUTTER



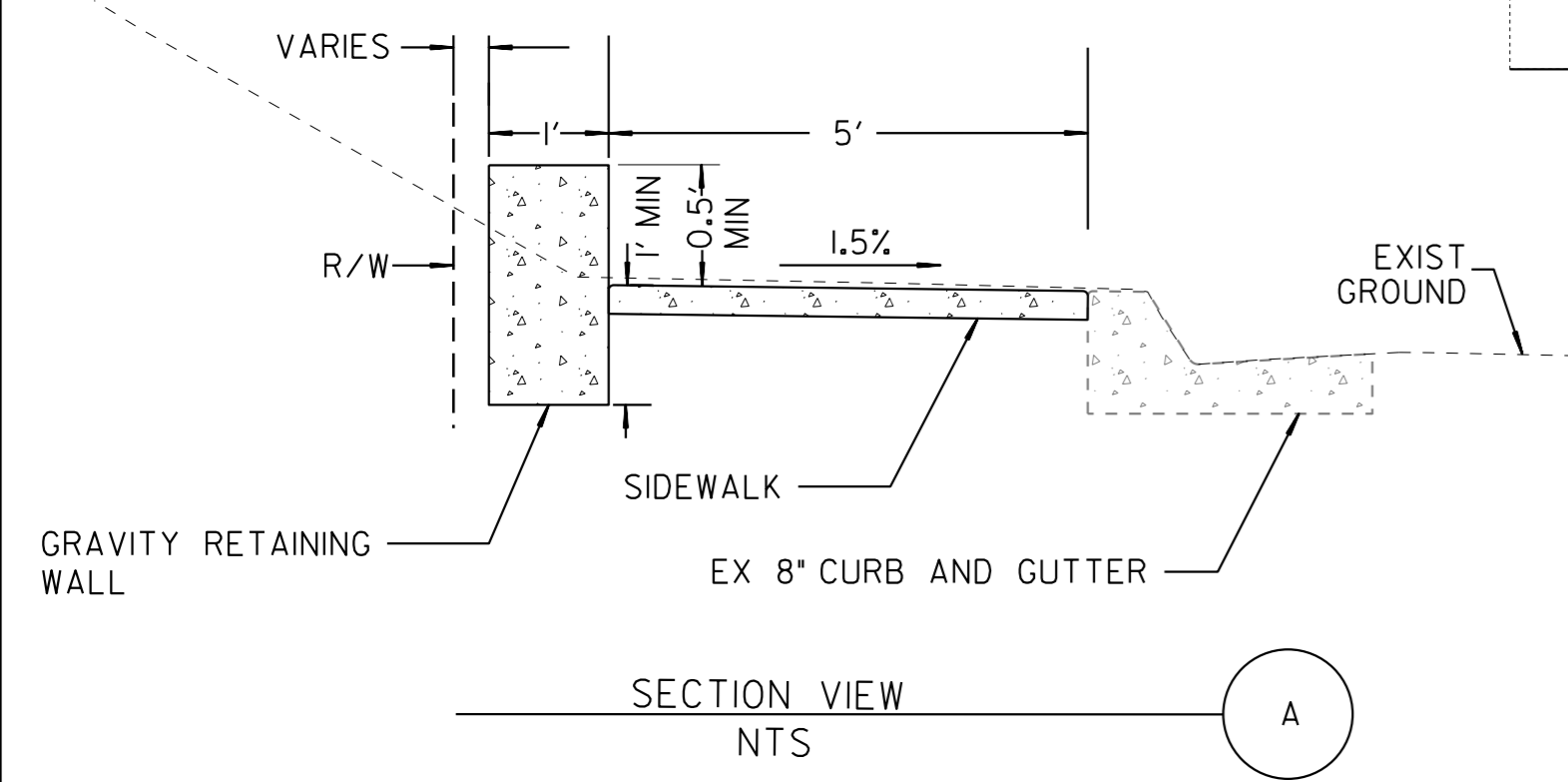
SCALE
1"=20' HORIZ.
1"=4' VERT.



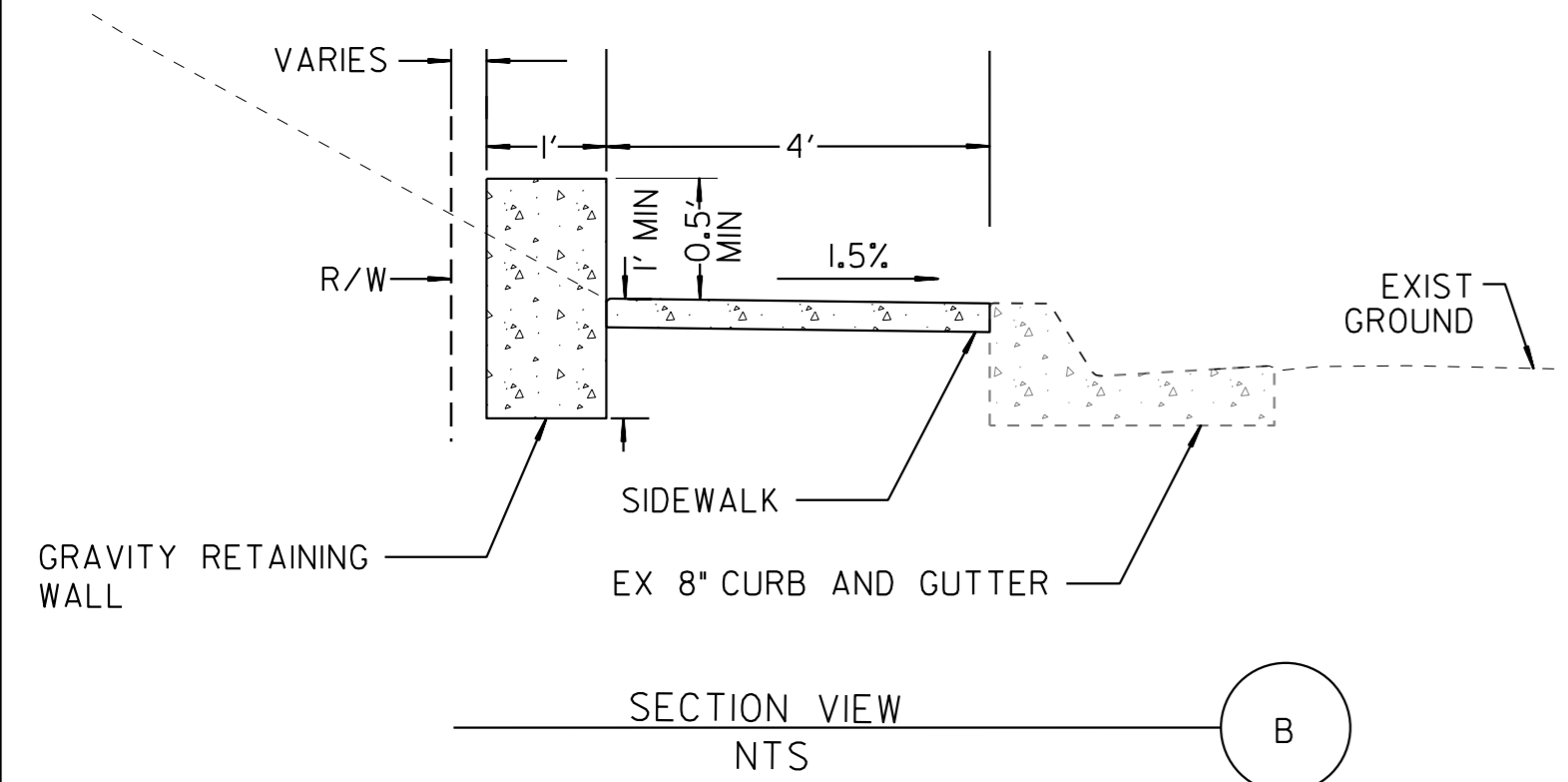
SECTION VIEW
NTS
FROM STA 4+04.07 TO STA 5+18.92



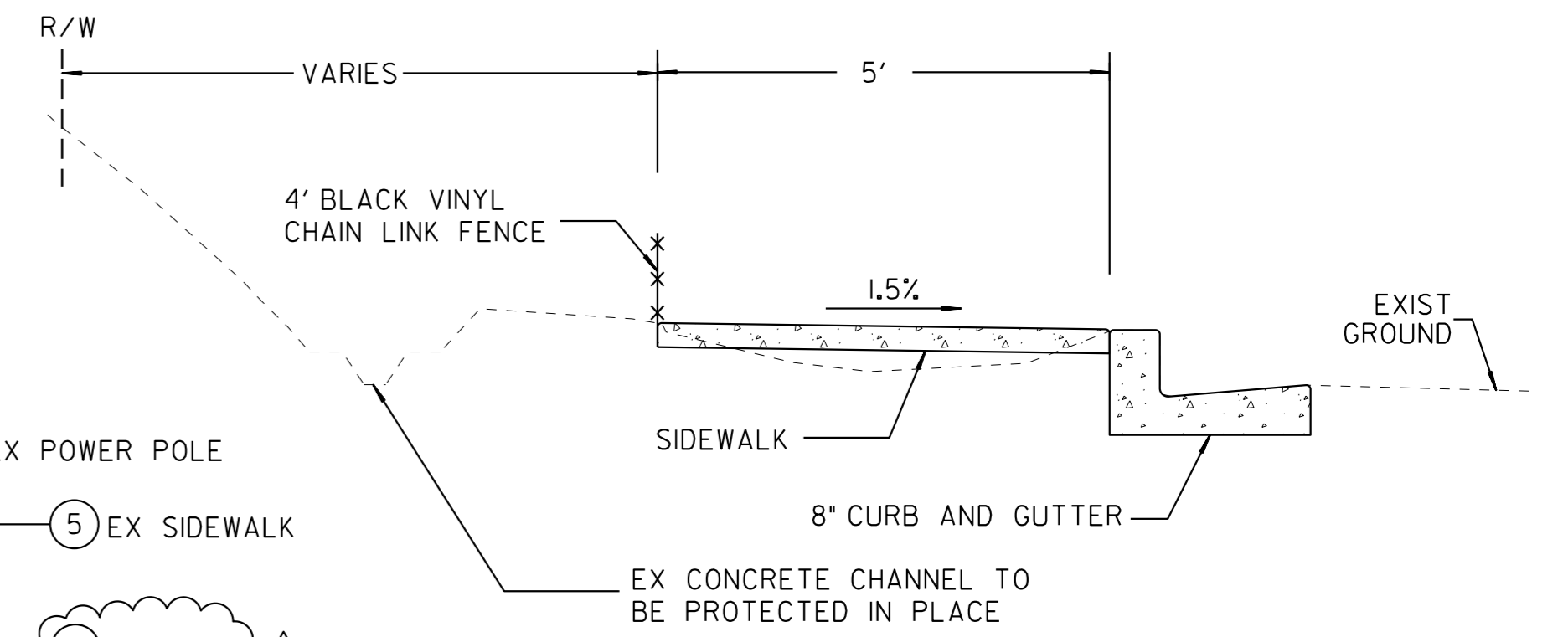
SECTION VIEW
NTS
FROM STA 5+18.92 TO STA 6+90.23



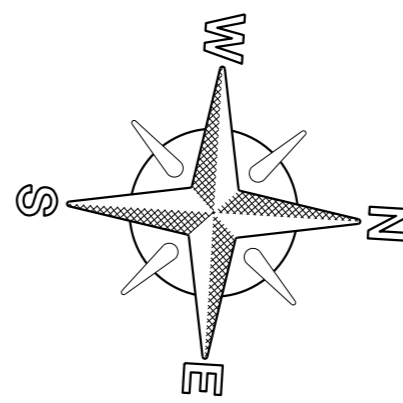
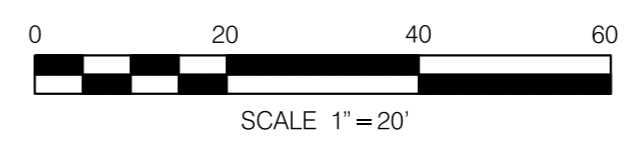
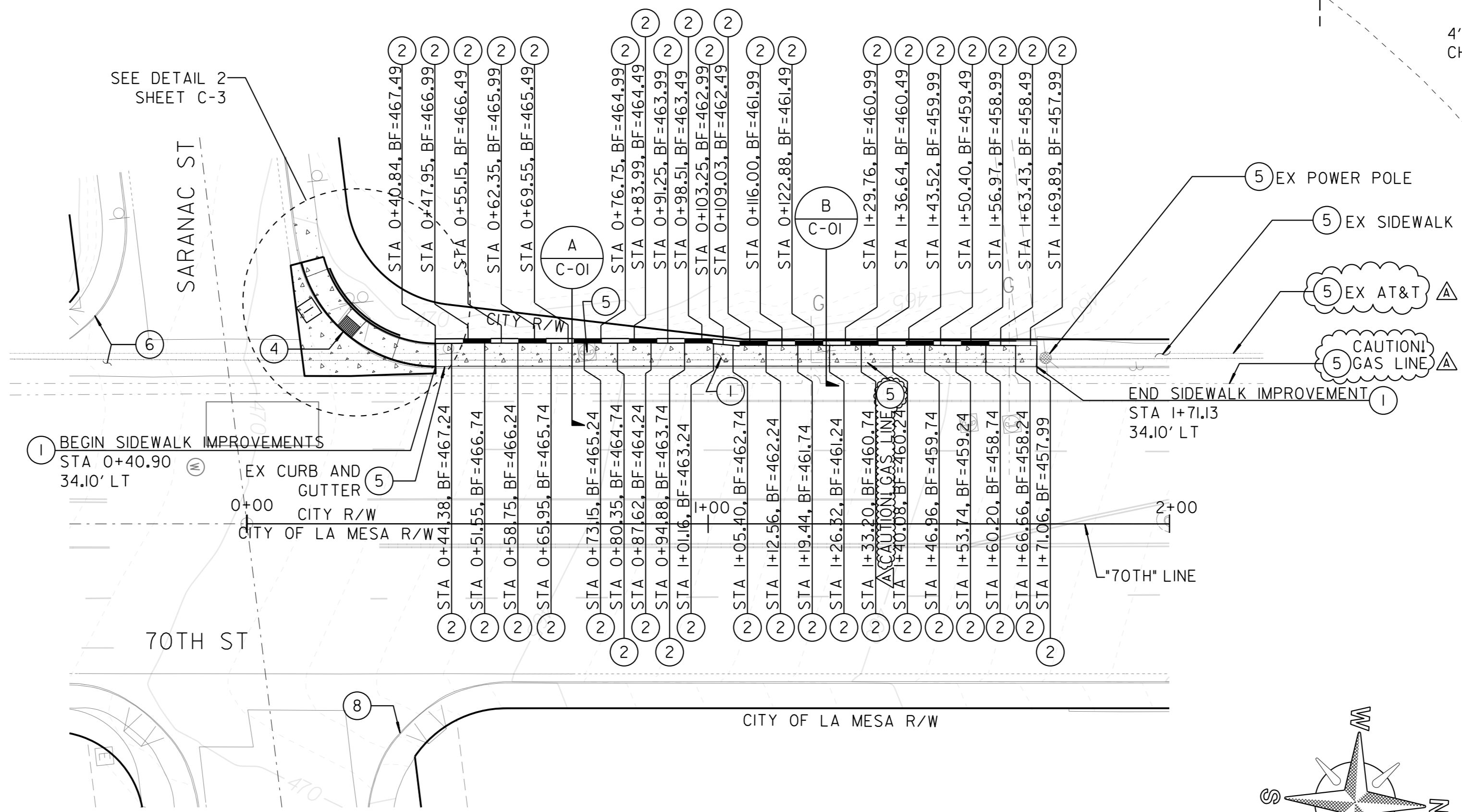
SECTION VIEW
NTS



SECTION VIEW
NTS

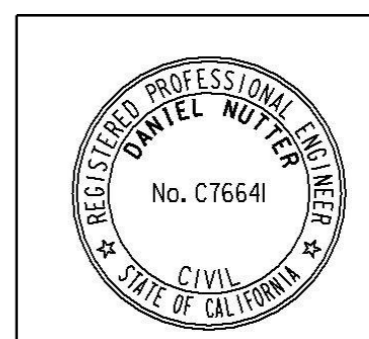


SECTION VIEW
NTS
FROM STA 6+90.23 TO STA 8+28.50

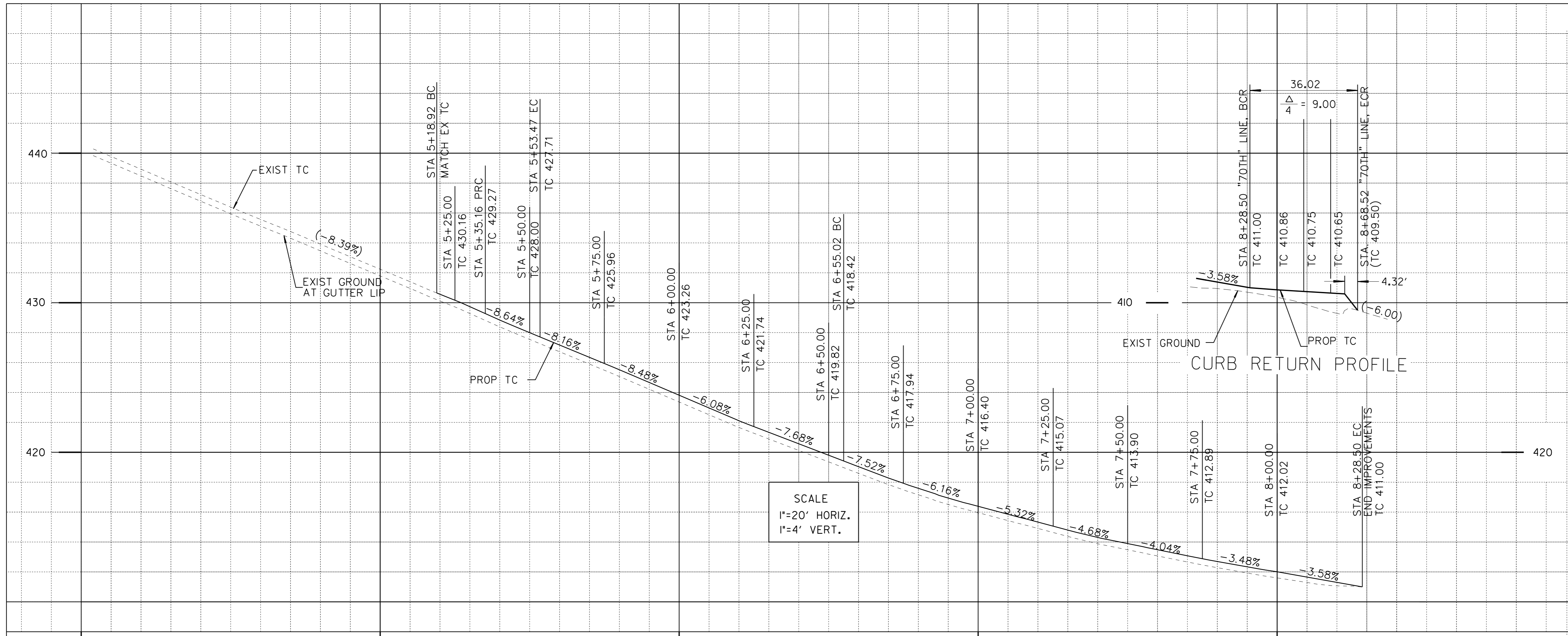


70TH ALVARADO TO SARANAC SIDEWALK IMPROVEMENT PLAN

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 03 OF 07 SHEETS		WBS# B-17065
APPROVED: <i>D. Nutter</i> FOR CITY ENGINEER DANIEL NUTTER PRINT JOB NAME	DATE: 03/15/2019 DATE: 7/6/41 RCE#	SUBMITTED BY: HONG LE PROJECT MANAGER CHECKED BY: JOHANNA RIVERA PROJECT ENGINEER
DESCRIPTION	BY	APPROVED
ORIGINAL	HL/JR	
ADDENDUM A	HL/JR	<i>D. Nutter</i>
		DATE FILMED: 04/18/2019
		DATE STARTED
		DATE COMPLETED
CONTRACTOR		INSPECTOR
1858444-6316407 CCS27 COORDINATE		40522-03-D CCS83 COORDINATE



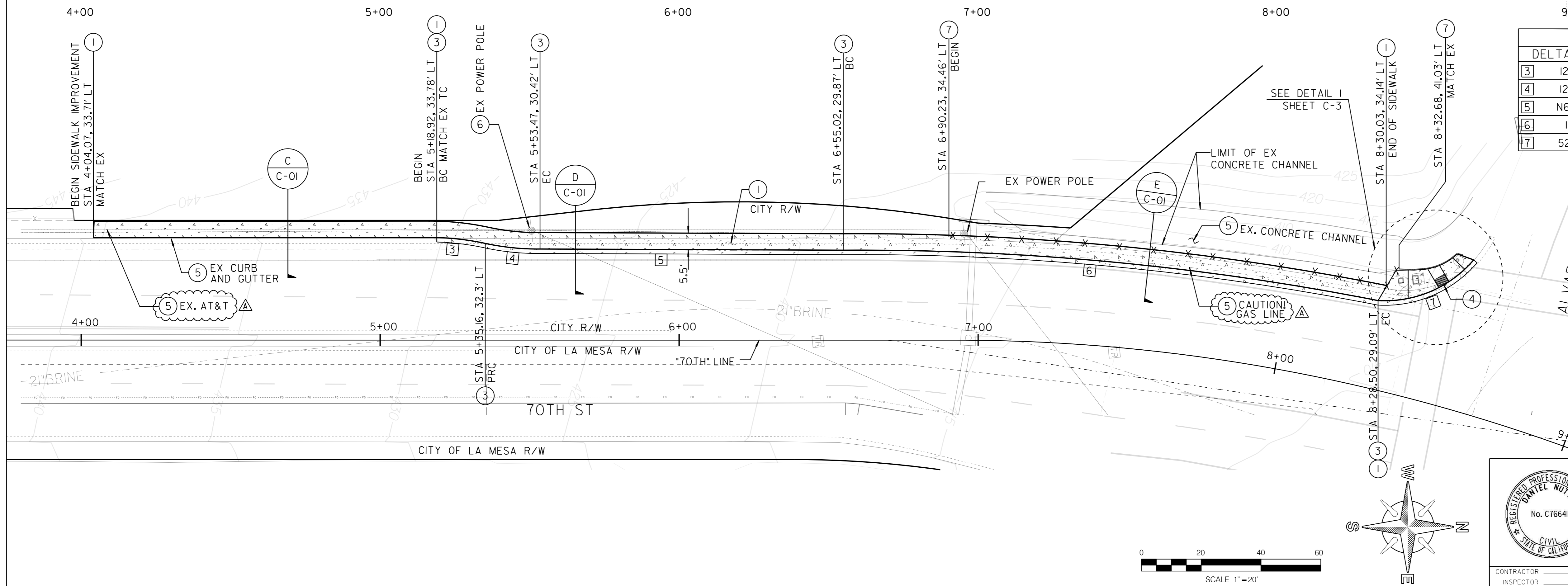
IMPROVEMENT PLAN



CONSTRUCTION NOTES

- ① INSTALL PCC SIDEWALK PER SDG-155 AND SDG-109
- ③ INSTALL TYPE G CURB AND GUTTER PER SDG-151
- ④ INSTALL MODIFIED TYPE C1 CURB RAMP PER SDG-135
- ⑤ PROTECT IN PLACE
- ⑦ INSTALL BLACK VINYL CHAIN LINK FENCE PER M-20 (H=4')
- ⑨ NW, NE, & SE CURB RAMPS TO BE CONSTRUCTED BY THE MONTEZUMA PPL/MID-CITY PIPELINE PH2 PROJECT

SCALE
1"=20' HORIZ.
1"=4' VERT.

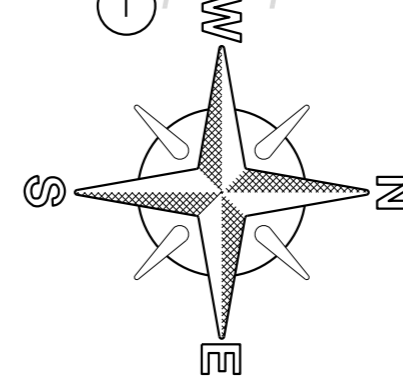
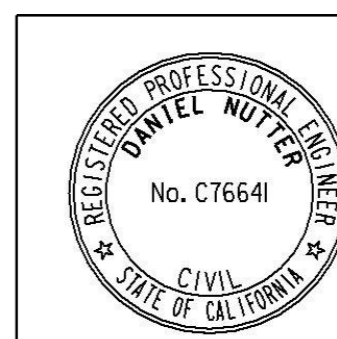


CURB DATA TABLE				
DELTA/BEARING	RADIUS	LENGTH	REMARKS	
③ 12° 22' 52"	87.50	18.91	8" TALL CURB AND GUTTER	
④ 12° 44' 20"	83.00	18.45	8" TALL CURB AND GUTTER	
⑤ N6° 29' 31"E	-	101.54	8" TALL CURB AND GUTTER	
⑥ 11° 28' 5"	898.50	179.84	8" TALL CURB AND GUTTER	
⑦ 52° 54' 48"	39.00	36.02	8" TALL CURB AND GUTTER	

C-02

70TH ALVARADO TO SARANAC SIDEWALK IMPROVEMENT PLAN
STA 4+04.00 TO STA 8+47.49

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 04 OF 07 SHEETS		WBS B-17065		
APPROVED: <i>[Signature]</i> FOR CITY ENGINEER DANIEL NUTTER PRINT EXE NAME	DATE 03/15/2019 76641 RCE#	SUBMITTED BY HONG LE PROJECT MANAGER CHECKED BY JOHANNA RIVERA PROJECT ENGINEER		
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	HL/JR			
ADDENDUM A	HL/JR	<i>[Signature]</i>	04/18/2019	
CONTRACTOR INSPECTOR		DATE STARTED	DATE COMPLETED	
			40522-04-D	



IMPROVEMENT PLAN

CONTRACTOR'S RESPONSIBILITIES

- PURSUANT TO SECTION 4216 OF THE CALIFORNIA GOVERNMENT CODE, AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION, YOU MUST CONTACT THE REGIONAL NOTIFICATION CENTER (E.G., UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA) AND OBTAIN AN INQUIRY IDENTIFICATION NUMBER.
- NOTIFY SDG&E AT LEAST 10 WORKING DAYS PRIOR TO EXCAVATING WITHIN 10' OF SDG&E UNDERGROUND HIGH VOLTAGE TRANSMISSION POWER LINES. (I.E., 69 KV & HIGHER)
- LOCATE AND RECONNECT ALL SEWER LATERALS. LOCATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. LATERAL RECORDS ARE AVAILABLE TO THE CONTRACTOR AT THE WATER DEPARTMENT, 2797 CAMINITO CHOLLAS. LOCATE THE IMPROVEMENTS THAT WILL BE AFFECTED BY LATERAL REPLACEMENTS.
- EXCAVATE AROUND WATER METER BOX (CITY PROPERTY SIDE) TO DETERMINE IN ADVANCE THE SIZE OF EACH SERVICE BEFORE TAPPING MAIN.
- CITY FORCES, WHEN SPECIFIED OR SHOWN ON THE PLANS, WILL MAKE PERMANENT CUTS & PLUGS AND CONNECTIONS.
- KEEP EXISTING MAINS IN SERVICE IN LIEU OF HIGH-LINING, UNLESS OTHERWISE SPECIFIED SHOWN ON PLANS.
- THE LOCATIONS OF EXISTING BUILDINGS AS SHOWN ON THE PLAN ARE APPROXIMATE.
- STORM DRAIN INLETS SHALL REMAIN FUNCTIONAL AT ALL TIMES DURING CONSTRUCTION.
- UNLESS OTHERWISE NOTED AS PREVIOUSLY POTHOLED (PH), ELEVATIONS SHOWN ON THE PROFILE FOR EXISTING UTILITIES ARE BASED ON A SEARCH OF THE AVAILABLE RECORD INFORMATION ONLY AND ARE SOLELY FOR THE CONTRACTOR'S CONVENIENCE. THE CITY DOES NOT GUARANTEE THAT IT HAS REVIEWED ALL AVAILABLE DATA. THE CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES EITHER SHOWN ON THE PLANS OR MARKED IN THE FIELD IN ACCORDANCE WITH THE SPECIFICATIONS SECTION 5-UTILITIES.
- EXISTING UTILITY CROSSINGS AS SHOWN ON THE PLANS ARE APPROXIMATE AND ARE NOT REPRESENTATIVE OF ACTUAL LENGTH AND LOCATION OF CONFLICT AREAS. SEE PLAN VIEW.
- ALL ADVANCE METERING INFRASTRUCTURE (AMI) DEVICES ATTACHED TO THE WATER METER OR LOCATED IN OR NEAR WATER METER BOXES, COFFINS, OR VAULTS SHALL BE PROTECTED AT ALL TIMES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
- NO JOINTS SHALL BE WITHIN 8' OF CROSSING UTILITIES CONVEYING LIQUIDS OR PARALLEL UTILITIES CONVEYING LIQUIDS THAT ARE 4' OR CLOSER (OUTSIDE PIPE WALL TO OUTSIDE PIPE WALL).
- PROVIDE HOLIDAY FREE LININGS AND COATING FOR VALVES PER AWWA C550. HOLIDAYS CANNOT BE FIELD REPAIRED AND MUST BE REPAIRED IN A FACILITY APPROVED BY THE MANUFACTURER. IF HOLIDAYS EXIST ONLY ON THE EXTERIOR SURFACE, THE CONTRACTOR HAS THE OPTION OF APPLYING WAX TAPE TO THE ENTIRE VALVE PER AWWA C217.
- PROVIDE HOLIDAY FREE COATINGS FOR DI FITTINGS WITH THE REQUIRED 24 MIL DFT PER WHITEBOOK 209-1.1.2, OTHERWISE THE FITTINGS WILL HAVE TO BE WAX TAPED PER AWWA C217.
- FOR COORDINATION OF THE SHUTDOWN OF TRANSMISSION MAINS (16-INCHES AND LARGER), CONTACT THE CITY'S SENIOR WATER DISTRIBUTION OPERATIONS SUPERVISOR AT (619) 527-7438. FOR COORDINATION OF THE SHUTDOWN OF DISTRIBUTION MAINS (LESS THAN 16-INCHES), CONTACT THE CITY'S WATER OPERATIONS MANAGER AT (619) 527-3945.

CONSTRUCTION STORM WATER PROTECTION NOTES

- TOTAL SITE DISTURBANCE AREA (ACRES) 1.11 AC
HYDROLOGIC UNIT/WATERSHED PUEBLO SAN DIEGO & SAN DIEGO
HYDROLOGIC SUBAREA NAME & NO CHOLLAS/908.22 & MISSION SAN DIEGO/907.11
- THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE
 WPCP
THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NO. R9-2013-0001 AS AMENDED BY R9-2015-0001 AND R9-2015-0100
 SWPPP
THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NO. R9-2013-0001 AS AMENDED BY R9-2015-0001 AND R9-2015-0100 AND CONSTRUCTION GENERAL PERMIT ORDER 2009-0009-DWQ AS AMENDED BY ORDER 2010-0014-DWQ AND 2012-0006-DWQ
TRADITIONAL RISK LEVEL 1 2 3
LUP: RISK TYPE 1 2 3
- CONSTRUCTION SITE PRIORITY
 ASBS HIGH MEDIUM LOW

MONUMENTATION/SURVEY NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. A LICENSED LAND SURVEYOR OR LICENSED CIVIL ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING IN THE STATE OF CALIFORNIA SHALL FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK, DEMOLITION OR SURFACE IMPROVEMENTS. IF DESTROYED, A LICENSED LAND SURVEYOR SHALL REPLACE SUCH MONUMENT(S) WITH APPROPRIATE MONUMENTS. WHEN SETTING SURVEY MONUMENTS USE FOR RE-ESTABLISHMENT OF THE DISTURBED CONTROLLING SURVEY MONUMENTS AS REQUIRED BY SECTIONS 6730.2 AND 8771 OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED WITH THE COUNTY SURVEYOR. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE CITY OF SAN DIEGO FIELD SURVEY SECTION SHALL BE NOTIFIED IN WRITING AT LEAST 7 DAYS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.

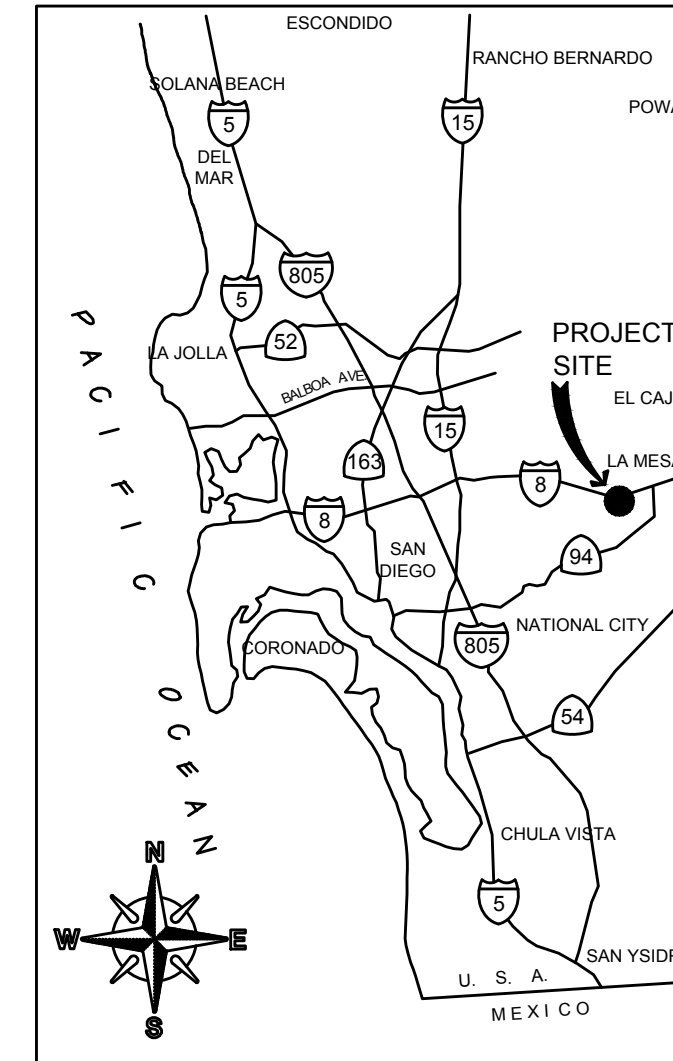
WORK TO BE DONE

- CONSTRUCTION OF NEW 66" CMLC&TC TRANSMISSION MAIN WITH CATHODIC PROTECTION, NEW 8" PVC DISTRIBUTION MAIN, WATER SERVICES, 2-4" FIBER OPTIC CONDUITS, EXISTING 16" WATER MAIN ABANDONMENT, STREET RESURFACING, CURB RAMPS AND ALL OTHER WORK SHOWN ON THESE PLANS AND SPECIFICATIONS.

MONTEZUMA PPL / MID-CITY PIPELINE PH2

ABBREVIATIONS

ABAND	ABANDON	IJTS	INSULATING JOINT TEST STATION
ABAND'D	ABANDONED	IRR	IRRIGATION
ACP	ASBESTOS CEMENT (PIPE)	LT	LEFT
AC	ASPHALTIC CONCRETE	MJ	MECHANICAL JOINT
AHD	AHEAD	MPBX	MULTI-POINT BOREHOLE EXTENSOMETER
AWTP	ALVARADO WATER TREATMENT PLANT	MTD	MULTIPLE TELEPHONE DUCT
ASSY	ASSEMBLY	MTBM	MICROTUNNEL BORING MACHINE
AVAR	AIR VACUUM & AIR RELEASE	MTS	METROPOLITAN TRANSIT SYSTEM
AWWA	AMERICAN WATER WORKS ASSOC	N.I.C.	NOT IN CONTRACT
BFV	BUTTERFLY VALVE	N/O	NORTH OF
BK	BACK	OVHD	OVERHEAD
BO	BLOWOFF	PE	PLAIN END
BOP	BOTTOM OF PIPE	PH	POTHOLE
BTWN	BETWEEN	PROP	PROPOSED
BW	BACK OF WALK	PVC	POLYVINYL CHLORIDE (PIPE)
CATV	CABLE TV	PVMT	PAVEMENT
CC	CALCIUM CHLORIDE	RCB	REINFORCED CONCRETE BOX
CI	CAST IRON	RCCP	REINFORCED CONCRETE CYLINDER PIPE
CICL	CAST IRON CEMENT LINED	RCP	REINFORCED CONCRETE PIPE
CML&C	CEMENT MORTAR LINED STEEL PIPE WITH CEMENT MORTAR OVERCOAT	RCSC	REINFORCED CONCRETE STEEL CYLINDER
CML&TC	CEMENT MORTAR LINED AND TAPE COATED STEEL PIPE WITH CEMENT MORTAR OVERCOAT	RED	REDUCER
COND	CONDUIT	R.O.S.	RECORD-OF-SURVEY
CONT	CONTINUED	RT	RIGHT
CONTR	CONTRACTOR	SD	STORM DRAIN
CPTS	CATHODIC PROTECTION TEST STATION	SDCW	SAN DIEGO COUNTY WATER AUTHORITY
DB	DIRECT BURIED	SDSD	SAN DIEGO STANDARD DRAWINGS
DI	DUCTILE IRON	SHT	SHEET
EB	ENCASED BURIED	SL	SEWER LATERAL
ECC	ECCENTRIC	SO	STUB OUT
EG	EXISTING GRADE	S/O	SOUTH OF
EL, ELEV	ELEVATION	SS	STAINLESS STEEL
ELEC	ELECTRIC	SSMH	SANITARY SEWER MANHOLE
ESMT	EASEMENT	STL	STEEL
EX, EXIST	EXISTING	SWR	SEWER
E/O	EAST OF	TC	TOP OF CURB
F	FLANGE	TEL	TELEPHONE
FCF	FLOW CONTROL FACILITY	TP	TOP OF PIPE
FH	FIRE HYDRANT	TYP	TYPICAL
FL	FLOW LINE	UNK	UNKNOWN
FS	FINISHED SURFACE	VC	VITRIFIED CLAY (PIPE)
GV	GATE VALVE	VERT	VERTICAL
HDPE	HIGH DENSITY POLYETHYLENE	WAS	WATER AGENCY STANDARDS
HP	HIGH PRESSURE	WD	WATER DISTRICT
HSS	HEAT SHRINK SLEEVE	WS	WATER SERVICE
HWD	HELIX WATER DISTRICT	WTR	WATER
IE	INVERT ELEVATION	WWM	WELDED WIRE MESH
		W/O	WEST OF



VICINITY MAP
NOT TO SCALE

FIELD DATA

BENCHMARK:

NWBP SARANAC STREET AND 69TH STREET, ELEV. 460.779 MSL, BASED ON NGVD 29 FEET AS SHOWN IN THE CITY OF SAN DIEGO BENCH BOOK.

CITY OF SAN DIEGO PRELIMINARY SURVEY FIELD NOTES:

MID-CITY PIPELINE PHASE II, WATKINS, 218-1752, W.O. S-11026, 7/10/2013

DATE: MEAN SEA LEVEL, NGVD 29

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT WAS DERIVED FROM A PREVIOUS STATIC GPS SURVEY USING ROS 14492, NAD 83 FEET, ZONE 6 (EPOCH 91.35), UTILIZING RTK/GPS FIELD PROCEDURES WITH A CALVRS BASE STATION BROADCAST 2013 AND CONSTRAINING TO GPS 17, GPS 1108 CHECKING GPS 1105, I.E. S 59°07'28" E.

HELIX WATER DISTRICT
W.O. 4515

ACCEPTED BY: JAMES A. TOMASULO DATE _____
DIRECTOR OF ENGINEERING

PLATS H-1-13-C, H-1-24-B

CITY OF LA MESA

REVIEWED BY: RICHARD B. LEJA DATE _____
R.C.E. 50279
DIRECTOR OF PUBLIC WORKS/
CITY ENGINEER

IMPROVEMENTS

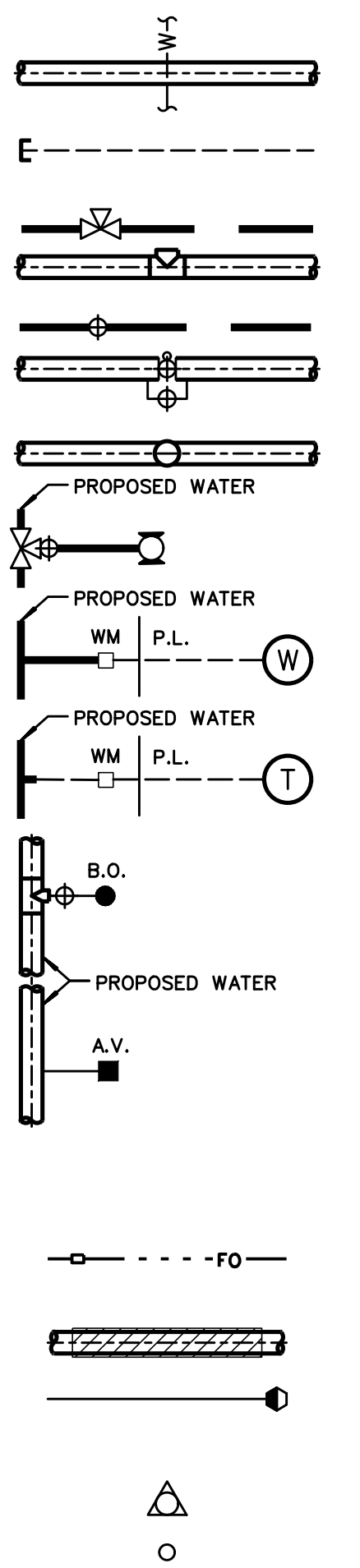
- TRENCH RESURFACING
- PIPE SUPPORT FOR UNDERCUT AC WATER MAIN
- CUTTING AND PLUGGING ABANDONED WATER MAIN
- WATER MAIN & APPURTENANCES
- VALVES WITH CAPS AND WELLS
- ACCESS MANWAY IN CONCRETE STRUCTURE
- 6" FIRE HYDRANT ASSEMBLY & MARKER 2-PORT UNLESS SPECIFIED AS 3-PORT
- 1" WATER SERVICE UNLESS OTHERWISE SPECIFIED
- WATER SERVICE TRANSFER
- BLOWOFF ASSEMBLY
- AIR VACUUM & AIR RELEASE VALVE
- HIGHLINING BY CONTRACTOR
- 2-4" FIBER OPTIC CONDUITS AND PULLBOX
- WATER MAIN STEEL CASING
- CATHODIC PROTECTION TEST STATION
- SURVEY WELL MONUMENT
- SURVEY MONUMENT
- FOR ADDITIONAL SYMBOLS SEE RESURFACING, CURB RAMP, AND TRAFFIC CONTROL SHEETS.

LEGEND

REFERENCE

- (SEE DETAILS ON SHT 27)
- SDW-162
- WP-03
- SDM-105, SDW-10, SDW-103, SDW-108, SDW-110, SDW-111, SDW-116, SDW-139, SDW-151 (1500 PSF, 225 PSI)
- SDW-109, SDW-152, SDW-153, SDW-154, WV-05
- D-9, M-3, SDD-114, SDM-113, SDW-103
- SDM-105, SDW-104, SDW-109, SDW-135, SDW-136, SDW-137, SDW-138, SDW-149, SDW-150, WS-03
- SDW-149, SDW-150
- SDM-105, SDW-106, SDW-143, SDW-144, SDW-145, SDW-146, WB-05
- SDM-105, SDW-117, SDW-160
- SDM-170, SDW-171, SDW-172, SDW-173
- SDM-105
- SDM-105, SDW-121, SDW-128, SDW-129, SDW-130, SDW-131, SDW-132, SDW-133
- M-10, M-10A, M-10B

SYMBOL



EXISTING STRUCTURES

WATER MAIN & VALVES	-----○-----	FENCE	-----X-----
WATER METER/SERVICE LINE	-----□-----	RIGHT-OF-WAY	----- -----
FIRE HYDRANT	○-----○	CALTRANS RIGHT-OF-WAY	----- -----
SEWER MAIN & MANHOLES	-----○-----	ELECTRIC VAULT/PEDESTAL	⊠
STORM DRAINS	=====	LIGHT FIXTURE	⊕
AC PAVEMENT (PROFILE)	////	IRRIGATION CONTROL BOX	⊠
GROUND LINE (PROFILE)	-----	WATER VAULT/MANHOLE	⊠
CONCRETE SURFACE (PROFILE)	-----	POWER POLE	●
TRAFFIC SIGNAL	⊗ TS	GAS VALVE	⊗
STREET LIGHT	⊕ SL	MONITORING WELL	⊗
GAS MAIN	-----	TRAFFIC SIGNAL PULLBOX	⊠
ELEC, TEL, OR CATV CONDUIT	---E---T---C---	TELEPHONE VAULT/PEDESTAL	⊠
SEWER FORCE MAIN	---FM---FM---	BACKFLOW DEVICE	⊠
RAILROAD, TROLLEY TRACKS			

G-1

CONSULTANT

PSOMAS

401 B Street, Suite 1600
San Diego, CA 92101
(619) 961-2800 (619) 961-2392 fax
www.psomas.com

PLANS FOR THE CONSTRUCTION OF
MONTEZUMA PPL / MID-CITY PIPELINE PH2

COVER SHEET

SPEC NO. 1821	CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 1 OF 89 SHEETS	WATER WBS S-11026 SEWER WBS N/A		
APPROVED: <u>Brian Vitelle</u> FOR CITY ENGINEER DATE 3/20/2019 PRINT DCE NAME BRIAN VITELLE RCE # C73039	DATE 3/20/2019 RCE # C73039	SUBMITTED BY: MARYAM KARGAR PROJECT MANAGER CHECKED BY: JACOB RIVERA PROJECT ENGINEER		
DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	PSO			
ADDENDUM A2	PSO	<u>Brian Vitelle</u>	5/1/19	
CONTRACTOR				
INSPECTOR				
DATE STARTED				
DATE COMPLETED				
37333-01-D				

CONSTRUCTION CHANGE / ADDENDUM				WARNING
CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.	0 1 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.
▲	5/8/19	CP-1 (37333-70-D), CP-3 (37333-72-D) G-4 (3733-4-D)		



MONTEZUMA PPL / MID-CITY PIPELINE PH2

GENERAL NOTES

(ALL NOTES SHOWN ON THIS SHEET SHALL APPLY TO WORK DONE IN THE CITY OF LA MESA)

- 1. NO WORK SHALL COMMENCE UNTIL ALL NECESSARY PERMITS HAVE BEEN OBTAINED FROM THE CITY OF LA MESA AND OTHER APPROPRIATE AGENCIES.
2. THE CONTRACTOR SHALL NOTIFY THE CITY OF LA MESA ENGINEERING DIVISION AT 619-667-1166 AT LEAST 48-HOURS PRIOR TO COMMENCEMENT OF ANY TYPE OF GRADING OR CONSTRUCTION ACTIVITY.
3. ALL EXISTING UTILITIES OR STRUCTURES REPORTED BY THE UTILITY COMPANIES ARE INDICATED HEREON BASED ON INFORMATION OF RECORD. IT SHALL BE THE DUTY OF THE CONTRACTOR TO MAKE A DETERMINATION AS TO THE LOCATION OF ALL UTILITIES. THE CONTRACTOR SHALL NOT BEGIN WORK UNTIL HE/SHE HAS MADE THIS DETERMINATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS/HER FAILURE TO LOCATE AND PRESERVE ANY AND ALL UTILITIES. CALL UNDERGROUND SERVICE ALERT AT 1-800-227-2600 OR 811 AT LEAST TWO WORKING DAYS BEFORE STARTING CONSTRUCTION.
4. NEITHER THE OWNER, THE DESIGNER, NOR THE ENGINEER WILL ENFORCE SAFETY MEASURE REGULATIONS. THE CONTRACTOR SHALL DESIGN, CONSTRUCT, AND MAINTAIN ALL SAFETY DEVICES, INCLUDING SHORING AND BRACING, AND SHALL BE SOLELY RESPONSIBLE FOR CONFORMING TO ALL LOCAL, STATE AND FEDERAL SAFETY AND HEALTH STANDARDS, LAWS AND REGULATIONS. CONTRACTOR AGREES THAT HE/SHE SHALL ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THIS PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS; AND THAT THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD THE OWNER AND THE ENGINEER HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH PERFORMANCE OF WORK ON THIS PROJECT, WITH EXCEPTION FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, ARCHITECT OR THE ENGINEER.
5. NOTWITHSTANDING THE MINIMUM STANDARDS SET FORTH IN THE GRADING ORDINANCE AND NOTWITHSTANDING THE APPROVAL OF THESE GRADING PLANS, THE PERMITTEE IS RESPONSIBLE FOR THE PREVENTION OF DAMAGE TO ADJACENT PROPERTY. NO PERSON SHALL EXCAVATE ON LAND SO CLOSE TO THE PROPERTY LINE AS TO ENDANGER ANY ADJOINING PUBLIC STREET, SIDEWALK, ALLEY OR FUNCTION OF ANY SEWAGE DISPOSAL SYSTEM OR ANY OTHER PUBLIC OR PRIVATE IMPROVEMENTS WITHOUT SUPPORTING AND PROTECTING SUCH IMPROVEMENTS FROM SETTLING, CRACKING, EROSION, SILTING, SCOUR OR OTHER DAMAGE WHICH MIGHT RESULT FROM THE GRADING DESCRIBED ON THIS PLAN. THE CITY WILL HOLD THE PERMITTEE RESPONSIBLE FOR ALL DAMAGES AND THE PERMITTEE SHALL REPAIR OR REMOVE AND REPLACE AT NO COST TO THE CITY OF LA MESA.
6. THE APPLICANT/DEVELOPER SHALL PROVIDE, BEFORE COMMENCEMENT OF ANY TYPE OF GRADING OPERATION AND CONSTRUCTION OF PRIVATE OR PUBLIC IMPROVEMENTS, A "HAUL ROUTE" MAP AND RELATED TRAFFIC CONTROL MAP WHICH WILL BE REVIEWED AND APPROVED BY THE CITY OF LA MESA ENGINEER.
7. THE CITY OF LA MESA WILL NOT MAINTAIN, OR ASSUME RESPONSIBILITY OR LIABILITY FOR, PRIVATE DRAINAGE SYSTEMS OR RUNOFF. IT SHALL BE THE RESPONSIBILITY OF THE PROPERTY OWNER TO MAINTAIN AND PREVENT DAMAGE FROM FLOODING TO ADJACENT PROPERTIES.
8. THE CONTRACTOR SHALL PROTECT EXISTING PUBLIC AND PRIVATE IMPROVEMENTS. IF ANY EXISTING IMPROVEMENTS ARE DAMAGED DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL REPAIR OR REMOVE AND REPLACE AT THEIR EXPENSE.
9. UNLESS OTHERWISE SHOWN, ALL SEWER LATERALS SHALL BE INSTALLED NORMAL TO THE MAIN.
10. ALL TEMPORARY PAVING PLACED BY ANY CONTRACTOR, SUBCONTRACTOR OR UTILITY COMPANY SHALL REMAIN IN THE PUBLIC RIGHT-OF-WAY FOR NOT MORE THAN THIRTY CALENDAR DAYS ON RESIDENTIAL STREETS AND 72 HOURS ON ALL OTHER STREETS, PRIOR TO PLACEMENT OF PERMANENT PAVEMENT.

GRADING NOTES

- 1. ALL GRADING SHALL BE PERFORMED IN ACCORDANCE WITH THE APPROVED PLANS AND CITY OF LA MESA STANDARDS.
2. IMPORT MATERIAL SHALL BE OBTAINED FROM, AND EXPORT MATERIAL SHALL BE DISPOSED OF AT, A LEGAL SITE.
3. FILL SLOPES SHALL BE COMPACTED TO A RELATIVE COMPACTION OF 90 PERCENT OF MAXIMUM DRY DENSITY OR AS RECOMMENDED BY THE SOILS/GEOTECHNICAL ENGINEER.
4. ALL PROPOSED CONTOUR GRADES AND SPOT ELEVATIONS SHOWN ARE TO FINISHED SURFACE, FINISHED FLOOR OR FINISHED GRADE IN LANDSCAPED AREAS.
5. THE OWNER/CONTRACTOR SHALL PROVIDE EROSION CONTROL AS REQUIRED BY THE CITY OF LA MESA'S EROSION CONTROL POLICY.

SOILS/GEOTECHNICAL REPORT

- 1. A GEOTECHNICAL REPORT FOR THIS PROJECT WAS PREPARED BY:
2. ENGINEER'S NAME/FIRM NAME: SUSAN E. TANGES, SOUTHLAND GEOTECHNICAL CONSULTANTS
ADDRESS/PHONE: 1965 E. LEXINGTON AVENUE, UNIT 7A, EL CAJON, CA, (619) 442-8022
PROJECT NO./DATE PREPARED: JUNE 18, 2015
3. DAILY INSPECTION AND TESTING REPORTS, IF REQUIRED, SHALL BE PREPARED BY THE GEOTECHNICAL ENGINEER. THE REPORTS SHALL BE IMMEDIATELY AVAILABLE TO THE CITY OF LA MESA INSPECTOR ON REQUEST.
4. THE APPLICANT/DEVELOPER SHALL PROVIDE COMPACTION REPORTS AS REQUIRED BY THE CITY INSPECTOR.
5. THE APPLICANT/DEVELOPER SHALL PAY FOR ALL TESTS TO BE PERFORMED BY THE GEOTECHNICAL/SOIL ENGINEER.

AC. PCC TRENCH BACKFILL AND COMPACTION REQUIREMENTS

- 1. ALL EXISTING IMPROVEMENTS, INCLUDING STREET PAVEMENT, SHALL BE SAW CUT.
2. ASPHALT CONCRETE SHALL BE LAID IN TWO (2) LIFTS MINIMUM, SEE SHEETS 27 AND 39 THROUGH 42.
3. ON SITE PARKING LOTS SHALL BE PAVED WITH A MINIMUM OF 3" A.C. OVER 4" CLASS 2 OR D.G. BASE OR AS RECOMMENDED BY THE GEOTECHNICAL ENGINEER BASED ON R-VALUE.
4. THE STREET SECTION SHALL BE ADJUSTED DURING CONSTRUCTION IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE GEOTECHNICAL ENGINEER AND APPROVAL OF THE CITY OF LA MESA ENGINEER. (REFER TO TYPICAL SECTION.)
5. ALL CONCRETE CURBS, SIDEWALKS, DRIVEWAYS, AND SWALES SHALL BE CONSTRUCTED ON A MINIMUM OF 3" DG BASE OR AS OTHERWISE SHOWN ON PLANS.
6. ALL ONSITE PRIVATE IMPROVEMENTS MAY BE CONSTRUCTED ON NATIVE OR OTHER SUITABLE BASE MATERIAL IF APPROVED BY A GEOTECHNICAL/SOILS ENGINEER.
7. ASPHALT CONCRETE PAVEMENT SECTION SHALL BE PER SHT 27.
8. THE UPPER TWO AND ONE-HALF (2.5) FEET OF THE TRENCH MEASURED FROM TOP OF PAVEMENT IN THE PUBLIC RIGHT OF WAY/PUBLIC STREETS SHALL BE COMPACTED TO A RELATIVE COMPACTION OF 95 PERCENT OF MAXIMUM DRY DENSITY.
9. CLASS 2 MATERIAL SHALL MEET CALTRANS SPECIFICATIONS, SECTION 26-1.02A (3/4" MAXIMUM).
10. DISINTEGRATED GRANITE (D.G.) SHALL MEET THE GREEN BOOK SPECIFICATIONS, SECTION 400-2.31.
11. FOR MATERIAL TESTING, REFER TO CALTRANS SPECIFICATIONS, SECTION, 6-3.01

CONTOUR/TOPO/ELEVATIONS

- 1. THE CONTOURS/TOPO/ELEVATIONS SHOWN ON THESE PLANS ARE BASED ON FIELD SURVEY/MEASUREMENTS PERFORMED ON 7/10/13, 6/18/14 & 8/1/14, BY THE CITY OF SAN DIEGO.

CONSTRUCTION NOTES

- 1. THE CONTRACTOR SHALL COMPLY WITH CITY OF LA MESA MUNICIPAL CODE CHAPTER 10.80 NOISE REGULATION. ALL OPERATIONS CONDUCTED ON THE PREMISES, INCLUDING THE WARMING UP, REPAIR, ARRIVAL, DEPARTURE OR RUNNING OF TRUCKS, EARTHMOVING EQUIPMENT, CONSTRUCTION EQUIPMENT AND ANY OTHER ASSOCIATED GRADING EQUIPMENT SHALL BE LIMITED TO THE PERIOD BETWEEN 7:00 AM AND 4:30 PM EACH DAY, MONDAY THROUGH FRIDAY, AND NO EARTH WORKING OR GRADING OPERATIONS SHALL BE CONDUCTED ON THE PREMISES ON SATURDAYS, SUNDAYS OR HOLIDAYS.

STORM WATER MANAGEMENT AND DISCHARGE CONTROL

- 1. THE CONTRACTOR SHALL COMPLY WITH CITY OF LA MESA MUNICIPAL CODE CHAPTER 7.18 (STORM WATER MANAGEMENT AND DISCHARGE CONTROL).
2. THE CONTRACTOR SHALL BE RESPONSIBLE TO ESTABLISH A PLAN TO IMPLEMENT BEST MANAGEMENT PRACTICES (BMP'S) TO ELIMINATE SAND, SILT, CONCRETE WASH, DEBRIS OR POLLUTANT DISCHARGE TO THE PUBLIC STREETS AND STORM DRAIN SYSTEM. SUCH PLAN SHALL BE SUBMITTED TO AND REVIEWED BY THE CITY OF LA MESA ENGINEER PRIOR TO COMMENCEMENT OF ANY GRADING OR CONSTRUCTION ON THE SITE.
3. THE CONTRACTOR SHALL IMPLEMENT THE EROSION CONTROL MEASURES AS SHOWN ON EROSION CONTROL PLANS AND TAKE REMEDIAL AND PREVENTIVE ACTION IMMEDIATELY WHEN POLLUTANT DISCHARGE OCCURS AND/OR AS DIRECTED BY THE CITY OF LA MESA ENGINEER OR THE BUILDING OFFICIAL. THE CONTRACTOR SHALL BE REQUIRED TO PLACE ADDITIONAL EROSION CONTROL MATERIALS AS THE SITE CONDITION WARRANTS.
4. PAVED AREAS SHALL BE SWEEPED BY COMBINATION OF POWER BROOM AND/OR AIR VACUUM SWEEPERS.
5. ALL OF THE ABOVE CONDITIONS SHALL APPLY STARTING THE FIRST DAY OF CONSTRUCTION AND SHALL REMAIN IN EFFECT UNTIL ALL WORK HAS BEEN COMPLETED.

UTILITY NOTES

- 1. AN ADEQUATE WATER SUPPLY FOR FIRE PROTECTION SHALL BE MADE AVAILABLE AS SOON AS COMBUSTIBLE MATERIAL IS DELIVERED TO THE SITE.
2. ACCESS TO THE SITE SHALL BE MAINTAINED FOR THE USE OF HEAVY FIRE FIGHTING EQUIPMENT.

LANDSCAPE AND IRRIGATION

- 1. ALL SLOPES OVER THREE FEET IN HEIGHT SHALL BE PLANTED.
2. ALL MAJOR CUT AND FILL SLOPES (THOSE IN EXCESS OF 15 FEET VERTICALLY) SHALL BE PLANTED. REQUIRED IRRIGATION SYSTEM SHALL BE INSTALLED. AT THE DISCRETION OF THE CITY ENGINEER, ANY SLOPE THAT IS CONSIDERED A POTENTIAL EROSION HAZARD MUST ALSO BE PLANTED.
3. LANDSCAPE AND IRRIGATION PLANS SHALL BE APPROVED BY THE PLANNING DIVISION PRIOR TO ISSUANCE OF PERMITS.
4. THE OWNER SHALL INSTALL AND MAINTAIN LANDSCAPE AND IRRIGATION SYSTEM BETWEEN THE CURB AND THE PROPERTY LINE.
5. AN ENCROACHMENT PERMIT FROM THE CITY OF LA MESA ENGINEER'S OFFICE WILL BE REQUIRED FOR ANY WORK IN LA MESA RIGHT-OF-WAY, OR PUBLIC EASEMENTS.
6. ENCROACHMENT REMOVAL AGREEMENT, SUBJECT TO APPROVAL OF THE CITY OF LA MESA ENGINEER, SHALL BE EXECUTED FOR ANY TYPE OF PRIVATE IMPROVEMENTS ENCROACHING INTO THE PUBLIC RIGHT OF WAY OR PUBLIC EASEMENTS (E.G.: RETAINING WALL, FOOTING, FENCE, STEPS, SIGNS, STAMPED CONCRETE, ASPHALT CONCRETE DRIVEWAY, ETC.).
7. PERMIT FROM THE DIVISION OF OCCUPATIONAL SAFETY & HEALTH (DOSH) FOR CONSTRUCTION OF TRENCHES OR EXCAVATIONS WHICH ARE FIVE FEET OR DEEPER AND INTO WHICH A PERSON IS REQUIRED TO DESCEND.
8. A LETTER OF PERMISSION REQUIRED FROM PROPERTY OWNERS IF GRADING AND ANY OTHER WORK WILL BE PERFORMED ON ADJACENT PROPERTIES.
9. TRANSPORTATION PERMIT FOR UNUSUALLY WIDE AND HEAVY LOADS.

PERMITS

CONTRACTOR'S LICENSE AND LIABILITY INSURANCE

- 1. THE CONTRACTOR SHALL FURNISH THE CITY OF LA MESA A POLICY OR CERTIFICATE OF LIABILITY INSURANCE IN WHICH THE AGENCY IS THE NAMED INSURED OR IS NAMED AS AN ADDITIONAL WITH THE CONTRACTOR. A COMBINED SINGLE LIMIT POLICY WITH AGGREGATE LIMITS IN THE AMOUNT OF \$1,000,000 WILL BE CONSIDERED EQUIVALENT TO THE REQUIRED MINIMUM LIMITS (SECTION 7-3 OF THE GREEN BOOK).
2. PRIOR TO ISSUANCE OF THE ENCROACHMENT PERMIT, THE PRIME CONTRACTOR MUST HAVE CLASS 'A' LICENSE (GENERAL ENGINEERING CONTRACTOR) AS APPROVED BY THE CITY OF LA MESA ENGINEER.
3. THE CONTRACTOR SHALL PROVIDE PROOF OF INSURANCE AND LICENSE PRIOR TO ISSUANCE OF THE ENCROACHMENT PERMIT.

BUSINESS LICENSE

- 1. THE CONTRACTORS AND SUBCONTRACTORS ARE REQUIRED TO OBTAIN A BUSINESS LICENSE PRIOR TO THE COMMENCEMENT OF ANY TYPE OF CONSTRUCTION OR GRADING OPERATION PURSUANT TO THE LA MESA MUNICIPAL CODE SECTION 6.08.010 THROUGH 6.08.240. FOR INFORMATION CONTACT THE LA MESA FINANCE DEPARTMENT AT (619) 667-1118.

BOND RELEASE, "AS-BUILT" OR RECORD PLANS & ELECTRONIC FILES

- 1. THE CONTRACTOR SHALL MAINTAIN ONE SET OF PLANS WITH ALL CONSTRUCTION CHANGES. THE PLAN SHALL BE MADE AVAILABLE TO THE ENGINEER OF WORK TO PREPARE RECORD PLANS. THE BOND WILL BE RELEASED AND THE FINAL OCCUPANCY PERMIT WILL BE ISSUED ONLY AFTER THE RECORD PLANS (MYLARS) ARE PROVIDED WITH AN ELECTRONIC FILE AND THE PLANS ARE REVIEWED AND APPROVED BY THE CITY OF LA MESA INSPECTOR.

ADDITIONAL FEES AND USER FEE COST RECOVERY POLICY

- 1. ADDITIONAL PLAN REVIEW AND INSPECTION FEES WILL BE CHARGED FOR CONSTRUCTION REVISIONS TO THE APPROVED PLANS. THE MINIMUM FEE WILL BE FOR ONE-HALF HOUR OF THE CITY OF LA MESA STAFF TIME. THE ENGINEERS, ARCHITECTS AND DESIGNERS ARE ENCOURAGED TO PREPARE PLANS AS ACCURATE AS POSSIBLE TO AVOID ADDITIONAL FEES.

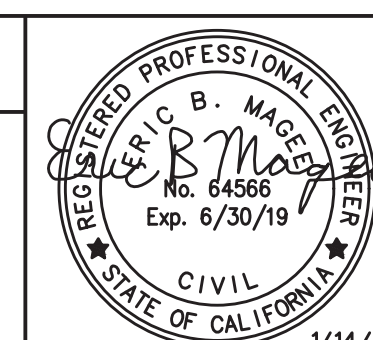
STANDARD SPECIFICATIONS AND STANDARD DRAWINGS

- 1. DESIGN CRITERIA FOR PUBLIC IMPROVEMENTS, ADOPTED BY THE CITY COUNCIL OF THE CITY OF LA MESA AS RESOLUTION NO. 15570, EFFECTIVE JULY 28, 1987.
2. STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, ("GREEN BOOK"), 2018 EDITION AND REGIONAL SUPPLEMENT AMENDMENTS.
3. STANDARD SPECIFICATIONS AND STANDARD PLANS, DEPARTMENT OF TRANSPORTATION (CALTRANS 2018 EDITION).
4. FOR ALL COMMERCIAL OR RESIDENTIAL WORK: ALL WORK SHALL COMPLY WITH 2013 CBC (CRC) FOR RESIDENTIAL, 2013 CEC, 2013 CMC, 2013 CPC, 2013 CALGREEN AND 2010 ENERGY CODE/2008 EES, 2013 CALIFORNIA FIRE CODE WITH CITY OF LA MESA MUNICIPAL CODE.
5. CITY OF LA MESA MUNICIPAL CODE, CHAPTER 14.05.
6. CITY OF LA MESA STANDARD DRAWINGS, INCLUDING SAN DIEGO AREA REGIONAL STANDARD DRAWINGS, 2015 EDITION.
7. HELIX WATER DISTRICT WATER AGENCY STANDARDS.

EXISTING MONUMENTS, SURVEY MARKERS AND PROPERTY CORNERS

- 1. THE CONTRACTOR SHALL RE-ESTABLISH ANY MONUMENT OR BENCH MARKS WHICH ARE DISTURBED DURING CONSTRUCTION.
2. A CORNER RECORD OR RECORD OF SURVEY AS APPROPRIATE SHALL BE FILED BY A LICENSED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER AS REQUIRED BY THE LAND SURVEYOR'S ACT.

CONSULTANT PSOMAS 401 B Street, Suite 1600 San Diego, CA 92101 (619) 961-2800 (619) 961-2392 fax www.psomas.com



MONTEZUMA PPL / MID-CITY PIPELINE PH2 CITY OF LA MESA NOTES. Includes project details, approval signatures, and a table with columns for DESCRIPTION, BY, APPROVED, DATE, and FILMED. Includes a stamp for MARYAM KARGAR, PROJECT MANAGER, and JACOB RIVERA, PROJECT ENGINEER.

NOTES - CITY OF LA MESA

G-4

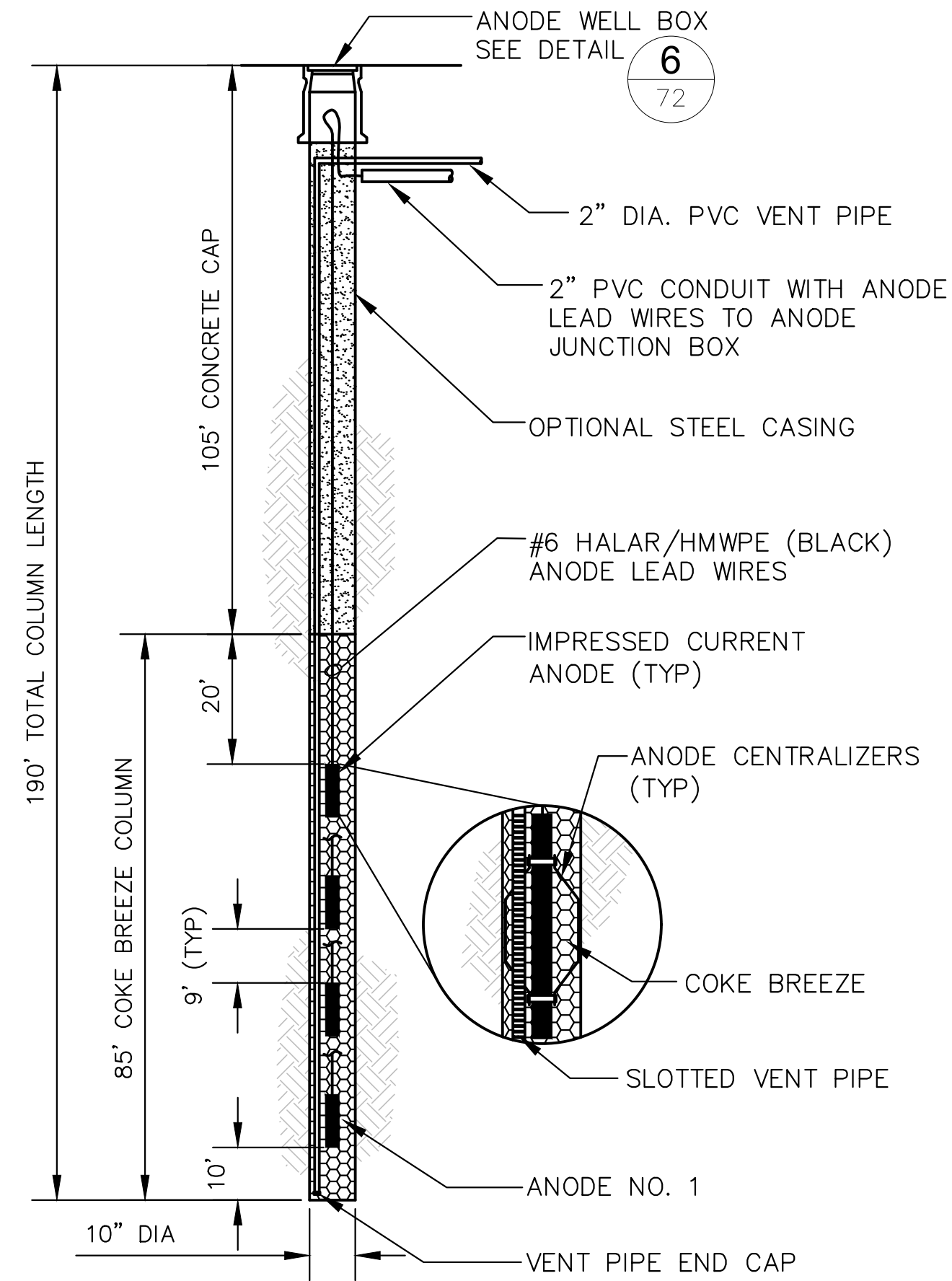
NOTE: IF THERE IS A CONFLICT WITH STANDARD DRAWINGS, DETAILS ON THIS SHEET SHALL TAKE PRECEDENCE

TEST STATION TABLE

TEST STATION No.	PIPELINE STATIONING	TEST STATION TYPE	STRUCTURES	DETAIL
1	13+50	POTENTIAL TEST STATION	66" PIPELINE	1/71
2	18+66	POTENTIAL TEST STATION	66" PIPELINE	1/71
3	25+00	POTENTIAL TEST STATION	66" PIPELINE	1/71
4	30+08	JOINT PIPELINE TEST STATION	66" PIPELINE AND 16" HP GAS	2/71
5	30+86	CASING TEST STATION	66" PIPELINE AND 82" STEEL CASING	5/-
6	38+02	CASING TEST STATION	66" PIPELINE AND 82" STEEL CASING	5/-
7	38+25	RECTIFIER	66" PIPELINE	2/-
8	41+15	POTENTIAL TEST STATION	66" PIPELINE	1/71
9	45+42	CASING TEST STATION	66" PIPELINE AND 82" STEEL CASING	5/-
10	45+69	JOINT PIPELINE AT CASING TEST STATION	66" PIPELINE AND 108" SDCWA PIPE	3/71
11	51+00	POTENTIAL TEST STATION	66" PIPELINE	1/71
12	56+74	POTENTIAL TEST STATION	66" PIPELINE	1/71
13	57+96	INSULATING JOINT TEST STATION	66" PIPELINE AND EXISTING PIPELINE OR STRUCTURE	4/-

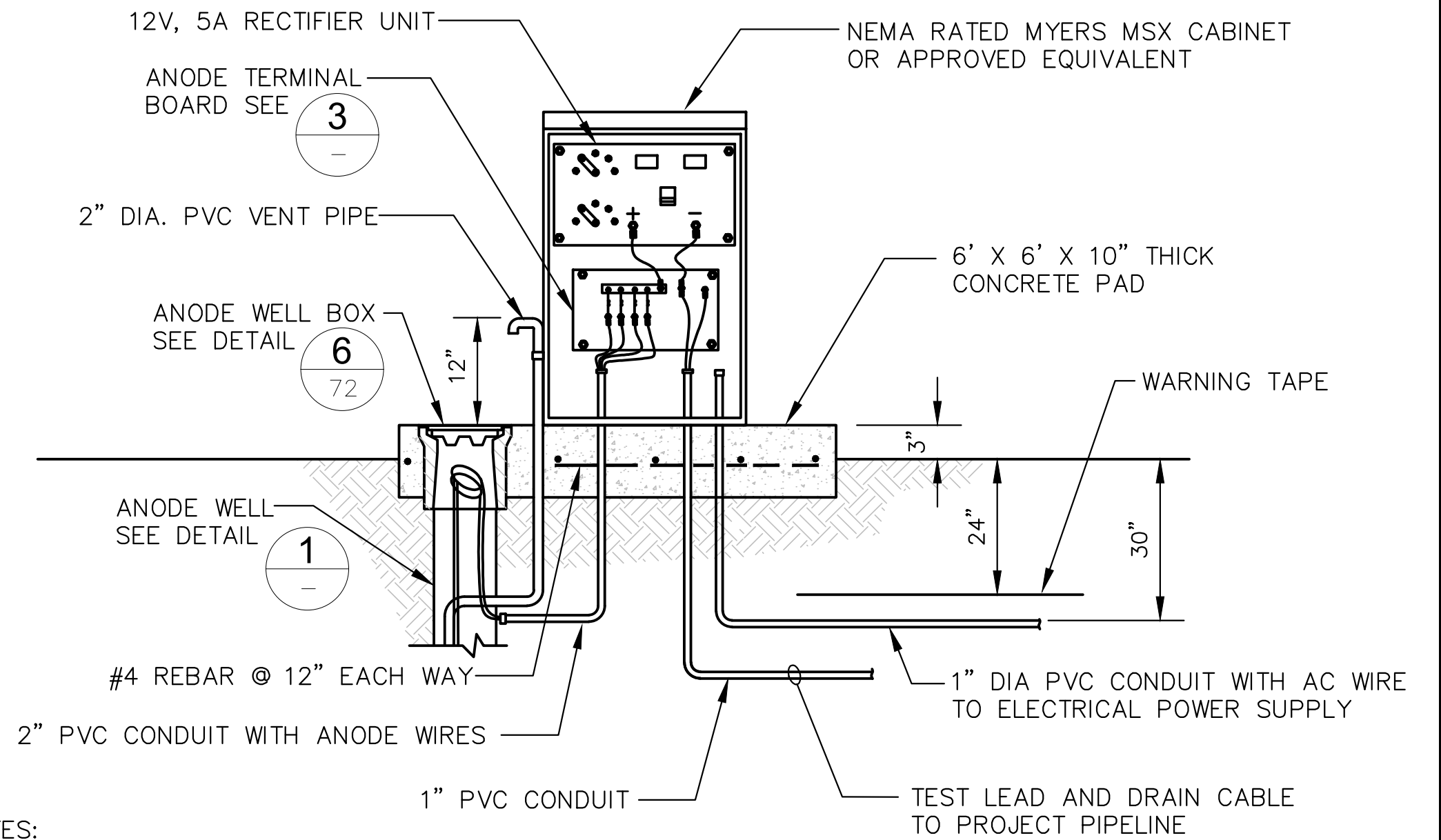
RECTIFIER AND DEEP ANODE WELL TABLE

STATION	SIZE OF RECTIFIER	ANODE		ANODE WELL		
		NUMBER	TYPE	DIAMETER (INCH)	DEPTH (FEET)	COKE COLUMN (FEET)
38+25	12 V - 5 A AIR COOLED RECTIFIER	4	2684Z HIGH SILICON CAST IRON	10	190	85



NOTE: WELL CASING MAY BE USED AT THE DISCRETION OF THE CONTRACTOR

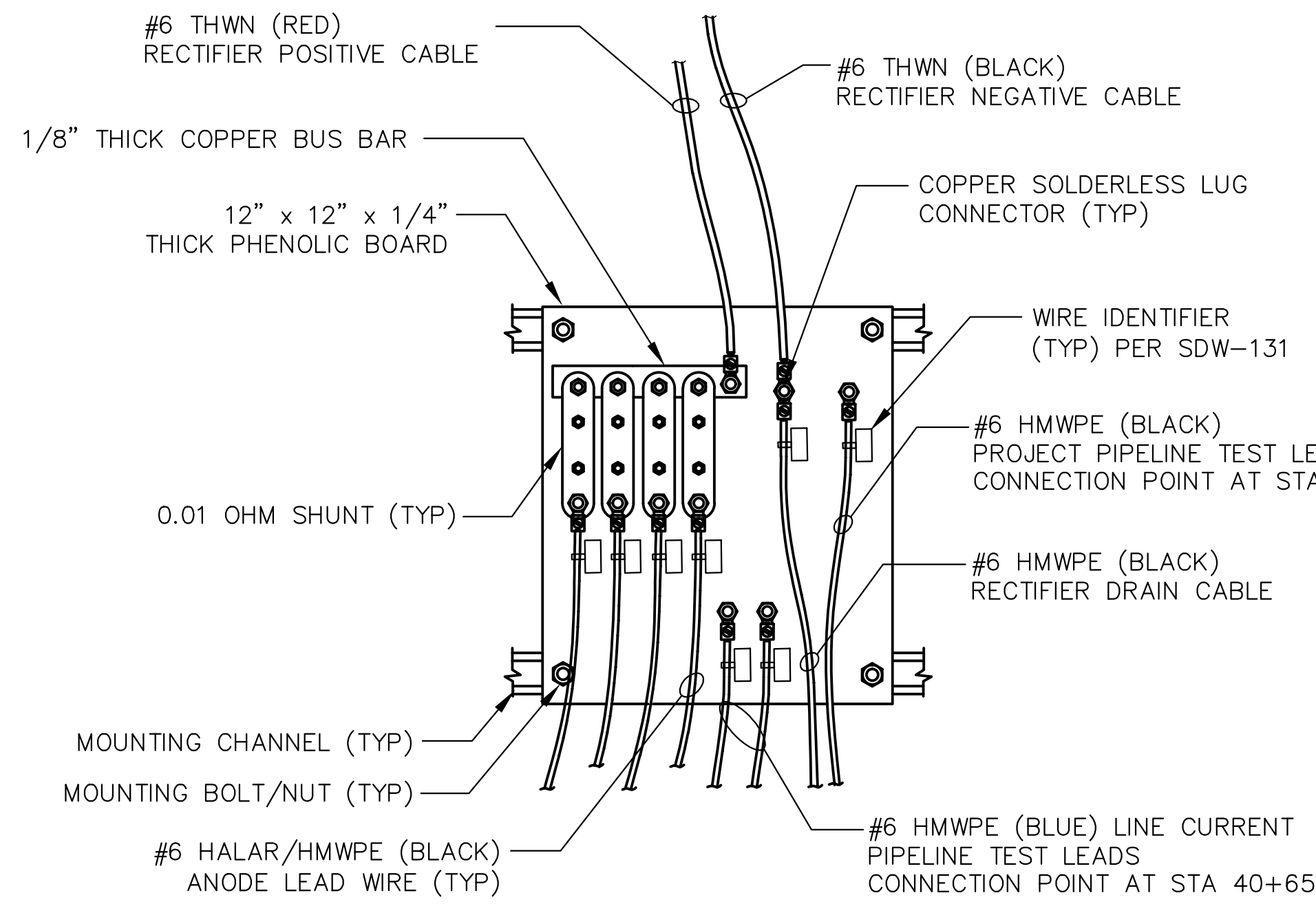
ANODE WELL DETAIL 1
NTS



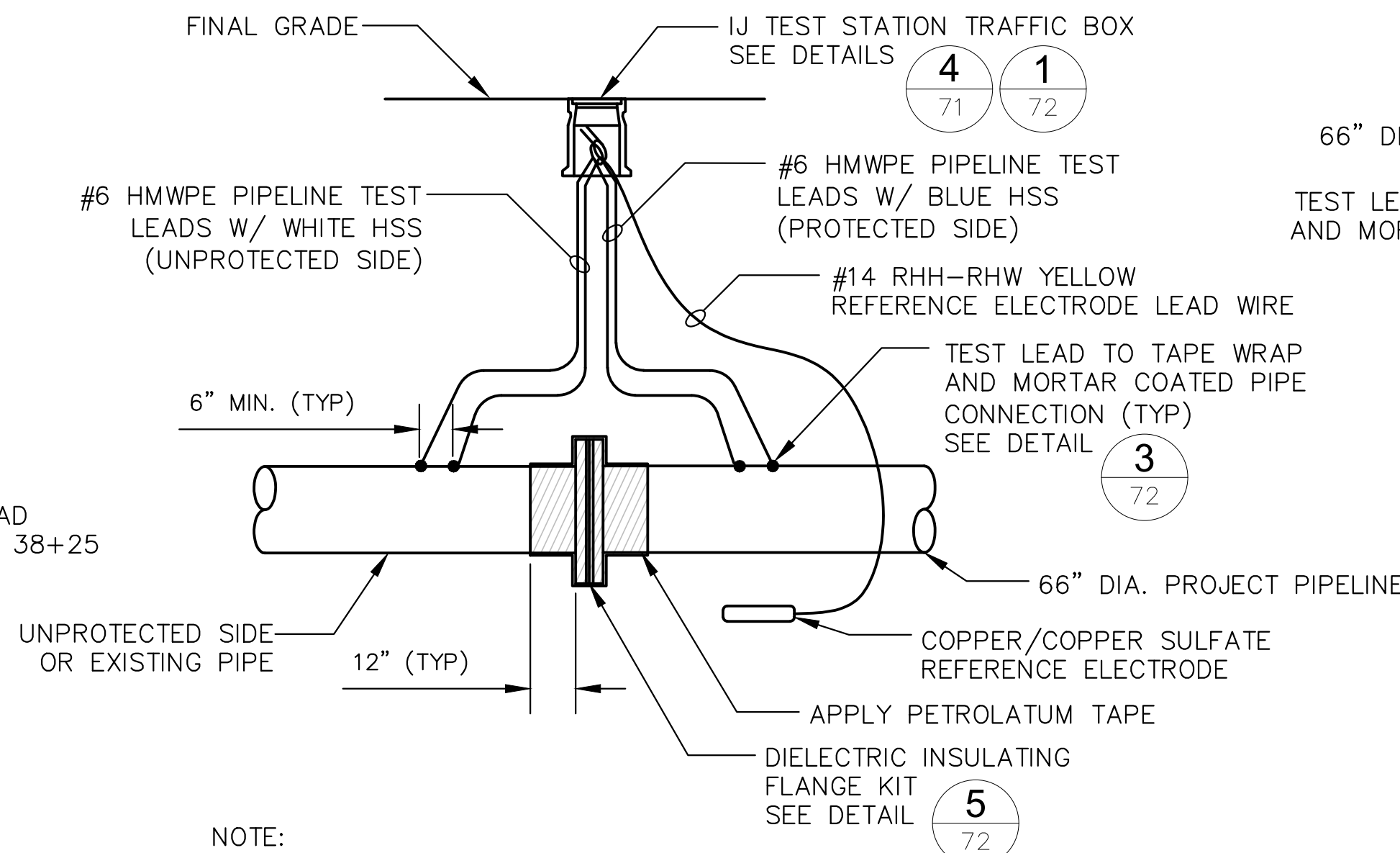
NOTES:

1. THE PEDESTAL AND ELECTRICAL METER SHALL BE INSTALLED IN A SEPARATE ENCLOSURE IN A LOCATION APPROVED BY SDG&E. THE STANDALONE ELECTRICAL METER PEDESTAL SHALL HAVE A FIVE FOOT CLEARANCE FROM THE RECTIFIER. SEE ELECTRICAL SITE PLANS.
2. ANODE WELL MAY BE INSTALLED REMOTE FROM RECTIFIER ENCLOSURE
3. RECTIFIER SHALL BE INSTALLED WITH AN AMERICAN INNOVATIONS GPS300 SYNCHRONIZED INTERRUPTER AND NTE ELECTRONICS INC. MODEL # RS3-1D40-41M SOLID STATE RELAY, NORMALLY OPEN, WITH HEAT SINK

RECTIFIER CABINET INSTALLATION DETAIL 2
NTS



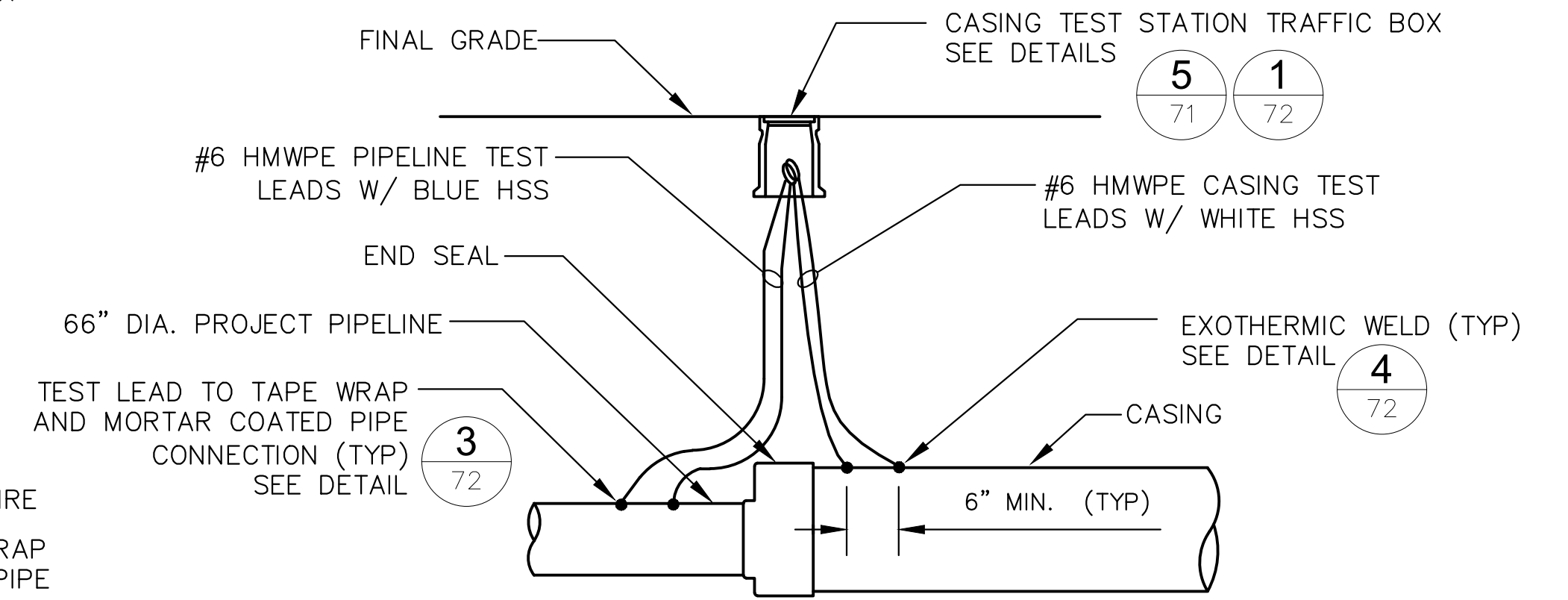
ANODE TERMINAL BOARD DETAIL 3
NTS



NOTE:

INSTALL ALL TEST STATION TRAFFIC BOXES OFF STREETS AND BEHIND EXISTING CURBS TO ALLOW FOR SAFE ACCESS BY CITY MONITORING PERSONNEL WHICH WILL NOT REQUIRE TRAFFIC CONTROL. INSTALLATION IN CENTER MEDIAN IS NOT ALLOWED.

IJ TEST STATION DETAIL 4
NTS



NOTE:

INSTALL ALL TEST STATION TRAFFIC BOXES OFF STREETS AND BEHIND EXISTING CURBS TO ALLOW FOR SAFE ACCESS BY CITY MONITORING PERSONNEL WHICH WILL NOT REQUIRE TRAFFIC CONTROL. INSTALLATION IN CENTER MEDIAN IS NOT ALLOWED.

CASING TEST STATION DETAIL 5
NTS

CP-1

MONTEZUMA PPL / MID-CITY PIPELINE PH2

CATHODIC PROTECTION SYSTEM DETAILS

CITY OF SAN DIEGO, CALIFORNIA
PUBLIC WORKS DEPARTMENT
SHEET 70 OF 89 SHEETS

WATER WBS S-11026
SEWER WBS N/A

APPROVED: *Brian Vitell* 3/20/2019
FOR CITY ENGINEER: BRIAN VITELL DATE: 3/20/2019
PROJECT MANAGER: MARYAM KARGAR
PROJECT ENGINEER: JACOB RIVERA
CHECKED BY: JACOB RIVERA
PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	V&A			
ADDENDUM A	V&A	<i>Brian Vitell</i>	4/19	

SEE EACH SHEET
CCS27 COORDINATE
SEE EACH SHEET
CCS83 COORDINATE

CONSULTANT
PSOMAS
401 B Street, Suite 1600
San Diego, CA 92101
(619) 961-2800 (619) 961-2392 fax
www.psomas.com

REGISTERED PROFESSIONAL ENGINEER
GLENN H. WILSON
NO. CR1076
CORROSION
STATE OF CALIFORNIA

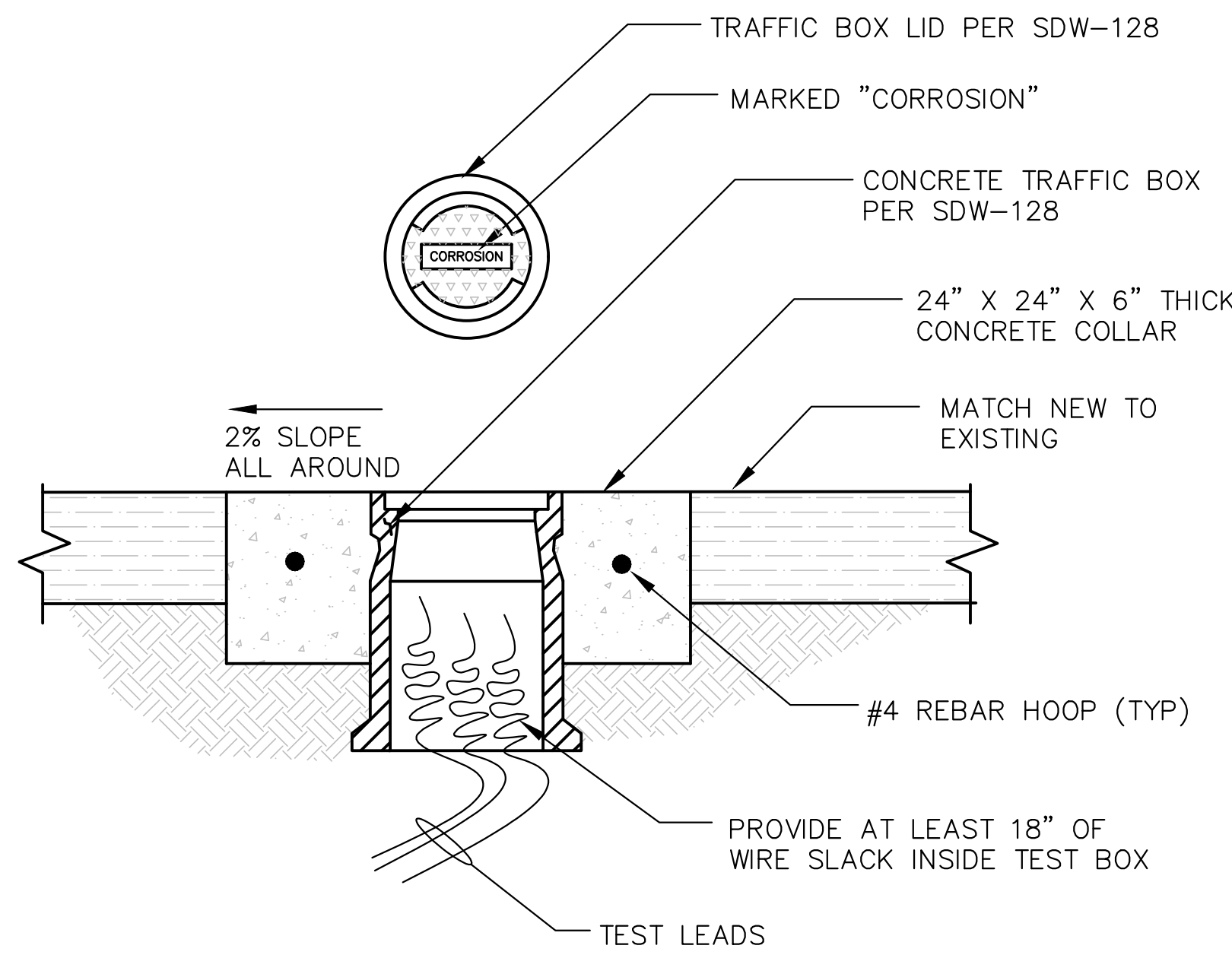
CONTRACTOR INSPECTOR DATE STARTED DATE COMPLETED
37333-70-D

REVISED SHEET - ADDED NOTE

ADDENDUM A

CATHODIC PROTECTION SYSTEM DETAILS

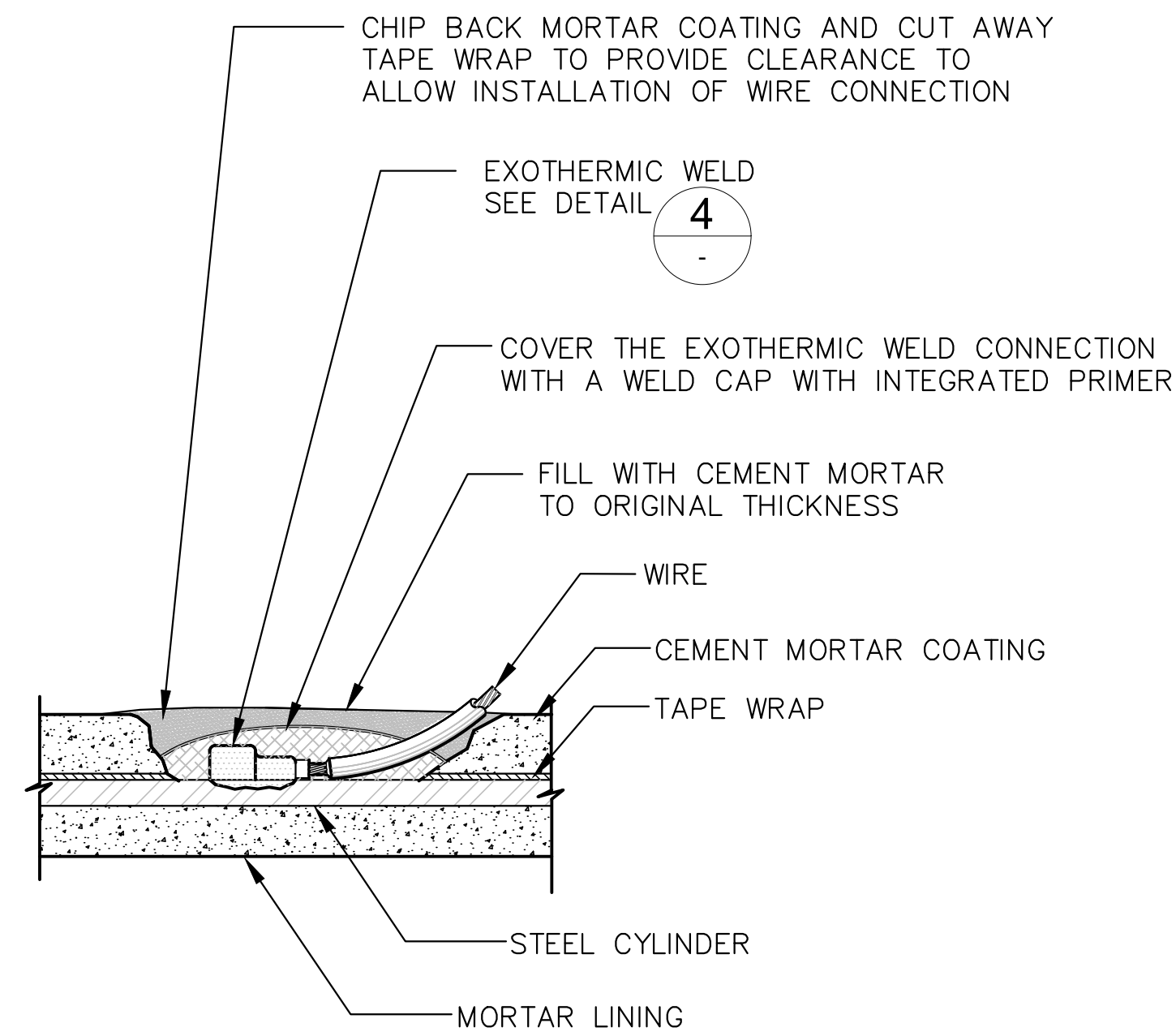
NOTE: IF THERE IS A CONFLICT WITH STANDARD DRAWINGS, DETAILS ON THIS SHEET SHALL TAKE PRECEDENCE



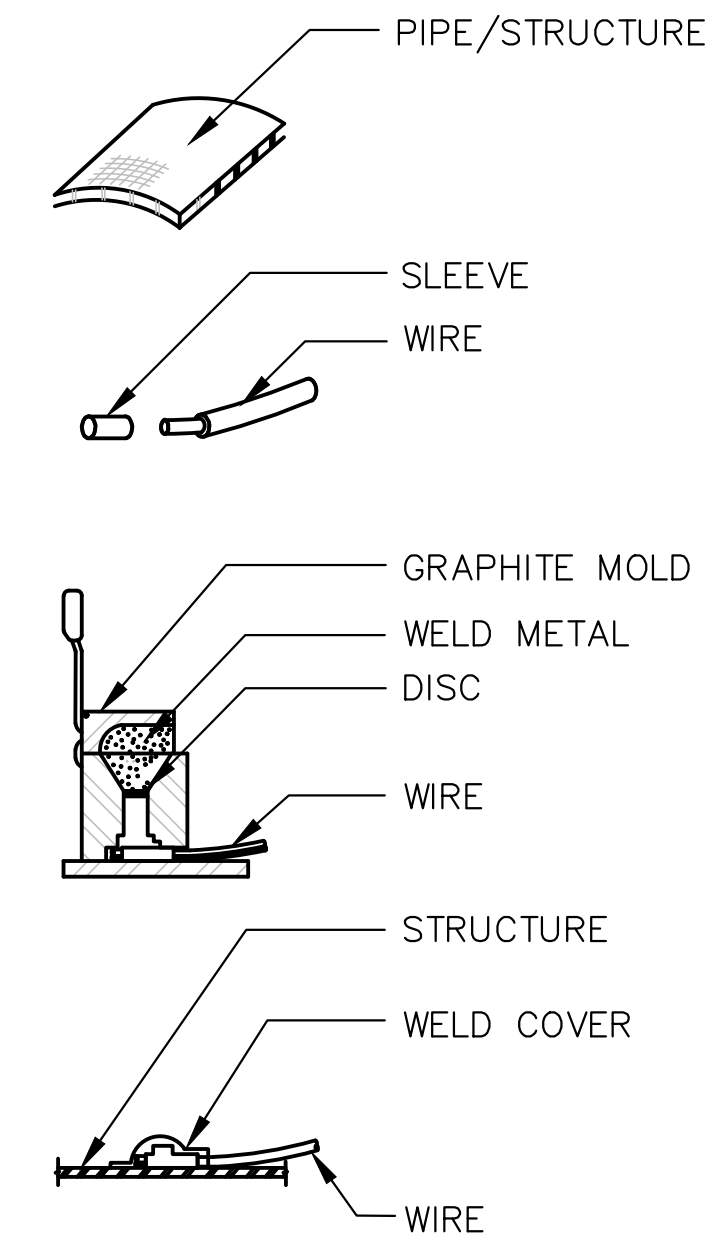
FLUSH MOUNTED TEST STATION DETAIL 1
NTS VAR

NOT USED

WIRE IDENTIFIER DETAIL 2
NTS VAR

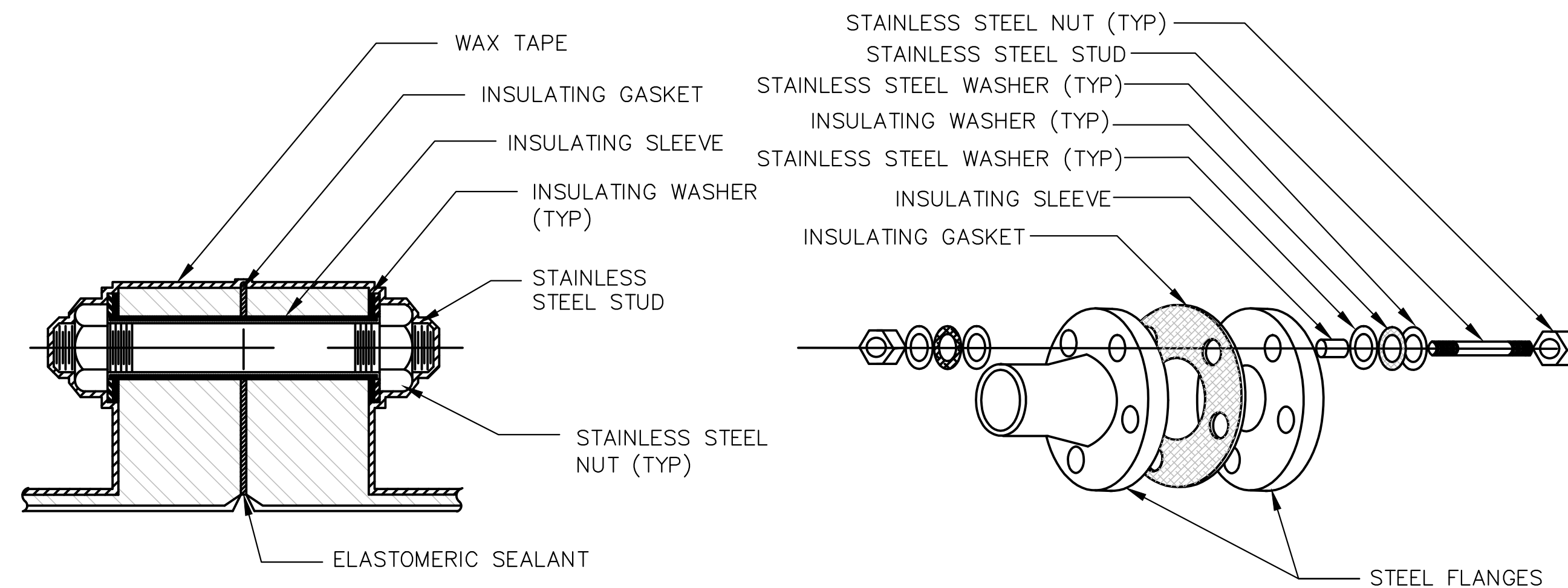


CONNECTION TO TAPE WRAPPED MORTAR COATED PIPE DETAIL 3
NTS VAR



EXOTHERMIC WELD DETAIL 4
NTS VAR

1. GRIND PIPE/STRUCTURE TO BARE METAL AND CLEAN SURFACE.
2. STRIP INSULATION FROM WIRE AND ATTACH SLEEVE.
3. HOLD MOLD FIRMLY WITH OPENING AWAY FROM OPERATOR, IGNITE WITH FLINT GUN, AND REMOVE SLAG FROM CONNECTION WITH CHIPPING HAMMER. TEST WELD WITH 22 OZ HAMMER.
4. COVER CONNECTION TO STEEL CASINGS WITH BITUMASTIC COATING AND WELD CAP OVER ALL EXPOSED METAL. COVER CONNECTION TO TAPE WRAPPED MORTAR COATED PIPE WITH CEMENT MORTAR. REPAIR ALL DAMAGE TO COATING AND LINING IN ACCORDANCE WITH MFG RECOMMENDATIONS.

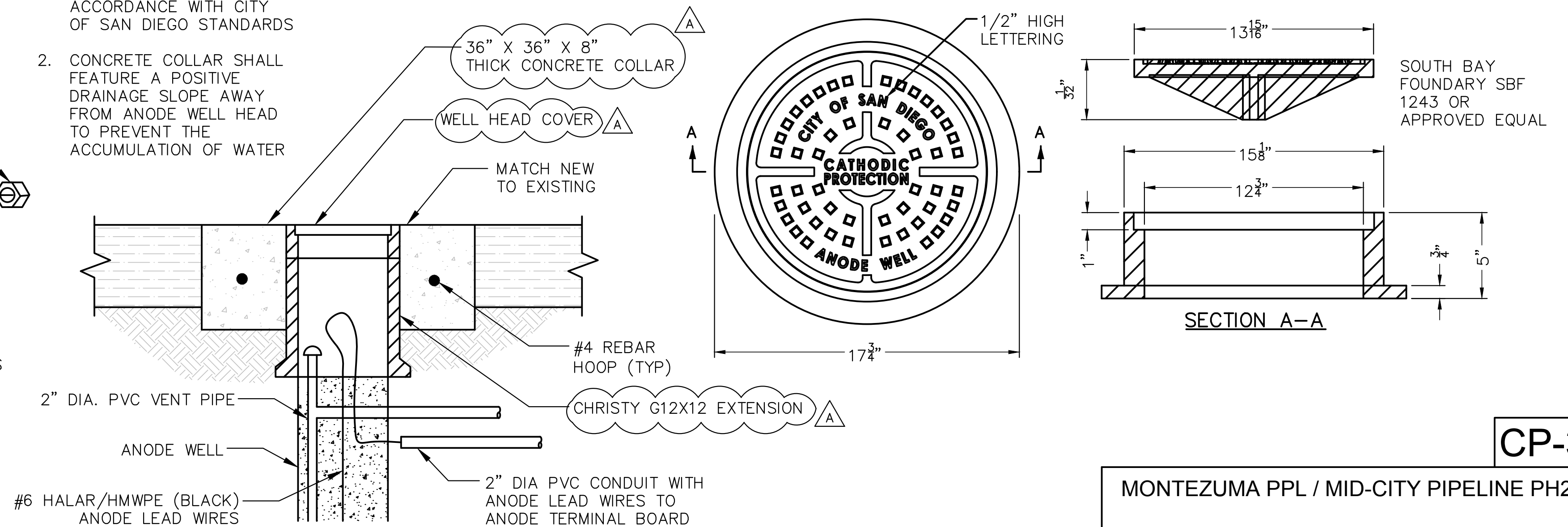


INSULATING FLANGE KIT DETAIL 5
NTS VAR

- NOTES:
1. THE COMPONENTS OF THE INSULATED FLANGE SHALL CONSIST OF NEMA G-10 GASKET, NEMA G-10 DIELECTRIC BOLT SLEEVES, AND NEMA G-10 DIELECTRIC WASHERS
 2. COAT ALL FLANGES, FLANGE BOLTS, AND NUTS WITH CITY OF SAN DIEGO STANDARD WAX TAPE COATING

NOTES:

1. ANODE WELL TRAFFIC BOX LID SHALL FEATURE A VANDALISM-RESISTANT LOCKING MECHANISM IN ACCORDANCE WITH CITY OF SAN DIEGO STANDARDS
2. CONCRETE COLLAR SHALL FEATURE A POSITIVE DRAINAGE SLOPE AWAY FROM ANODE WELL HEAD TO PREVENT THE ACCUMULATION OF WATER



ANODE WELL BOX DETAIL 6
NTS 70

CP-3

MONTEZUMA PPL / MID-CITY PIPELINE PH2		CATHODIC PROTECTION SYSTEM DETAILS	
CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 72 OF 89 SHEETS		WATER WBS S-11026	SEWER WBS N/A
APPROVED: <i>Brian Vitelle</i> FOR CITY ENGINEER BRIAN VITELLE PRINT DCE NAME	DATE 3/20/2019 C73039 RCE #	SUBMITTED BY: MARYAM KARGAR PROJECT MANAGER	CHECKED BY: JACOB RIVERA PROJECT ENGINEER
DESCRIPTION	BY	APPROVED	DATE
ORIGINAL	V&A		
ADDENDUM A	V&A	<i>Brian Vitelle</i>	4/19
CONTRACTOR INSPECTOR			DATE STARTED DATE COMPLETED
			37333-72-D

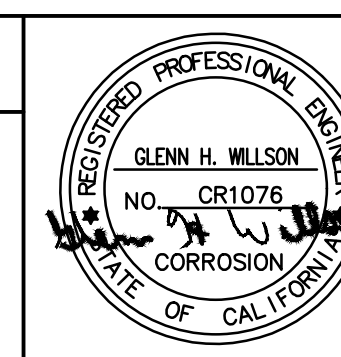


11011 Via Frontera, Suite C.
San Diego, CA 92127
Tel. (858) 576-0226

CONSULTANT

PSOMAS

401 B Street, Suite 1600
San Diego, CA 92101
(619) 961-2800 (619) 961-2392 fax
www.psomas.com



CATHODIC PROTECTION SYSTEM DETAILS

City of San Diego

CITY CONTACT: Brittany Friedenreich, Senior Contract Specialist, Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM B



FOR

MONTEZUMA PPL/MID-CITY PIPELINE PH2 AND 70TH-ALVARADO TO SARANAC-SIDEWALK

BID NO.: K-19-1821-DBB-3
SAP NO. (WBS/IO/CC): S-11026, B-17065
CLIENT DEPARTMENT: 2000, 2116
COUNCIL DISTRICT: 7, 9
PROJECT TYPE: KA, IK

BID DUE DATE:

**2:00 PM
MAY 22, 2019**

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

B. BIDDER'S QUESTIONS

Q1. In Addendum 2, there were two questions answered regarding the microtunneling of the drive under the I-8 Freeway. In the responses, the City left ambiguity to the answer. A1 on Addendum 2 allows the contractor to bid the I-8 crossing with any tunnel method. A10 on Addendum 2 states the crossing is to be Microtunnel only. Please clarify whether microtunneling is the only tunnel option for the I-8 crossing.

A1. Microtunneling is the only option for the I-8 crossing.

Q2. In Addendum 2, the question was asked of whether or not Permalok Pipe was approved by CalTrans for the I-8 tunnel drive. The response in A9 on Addendum 2 stated that the joints are to be welded.

a. From this, is it to be understood that:

i. Permalok remains the specified casing AND the joints are to be welded **in addition to** the mechanical joint

ii. Or that Permalok is not allowed and the joints are to be welded only?

b. If the Permalok is allowed, can the welding occur after the tunnel is complete?

A2. a. This is a contractor option: Permalok with welded joints or approved equal per spec (See Section 209-2.1 of the Supplementary Special Provisions). The weld should be 1/8" fillet weld single pass.

b. Contractor means and methods. If deemed safe (i.e. no groundwater), then weld after installation or weld as the casing is advanced.

Q3. Reference Sheets M-1 and M-3: The two BFV Vaults at Stations 29+50 and 38+85 have a Note to Contractor which states "Contractor to remove mortar coating (3" from inside of vault wall) and epoxy coat all steel pipe within vault."

Is the intent to have all of the pipe coating inside of the vault to be field applied? Please clarify.

A3. Yes to all piping. Contractor can decide if shop or field applied. If shop applied, touch up is required for coatings damaged during installation.

James Nagelvoort, Director
Public Works Department

Dated: *May 17, 2019*
San Diego, California

JN/RWB/cc

City of San Diego

CITY CONTACT: Brittany Friedenreich, Senior Contract Specialist, Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM C



FOR

MONTEZUMA PPL/MID-CITY PIPELINE PH2 AND 70TH-ALVARADO TO SARANAC-SIDEWALK

BID NO.: K-19-1821-DBB-3
SAP NO. (WBS/IO/CC): S-11026, B-17065
CLIENT DEPARTMENT: 2000, 2116
COUNCIL DISTRICT: 7, 9
PROJECT TYPE: KA, IK

BID DUE DATE:

**2:00 PM
MAY 28, 2019**

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ON THE COVER PAGE.**

B. NOTICE INVITING BIDS

1. To Section 7, pages 5 and 6, SKILLED AND TRAINED WORKFORCE LABOR REQUIREMENTS, **DELETE** in its entirety,
2. To Section 8, page 6, VETERANS OUTREACH, **DELETE** in its entirety.

C. ELECTRONICALLY SUBMITTED FORMS

1. To Certifications and Forms, item E, page 486, COMMITMENT TO COMPLY WITH SKILLED AND TRAINED WORKFORCE REQUIREMENTS, **DELETE** in its entirety.

D. FORMS

1. To COMMITMENT TO COMPLY WITH SKILLED AND TRAINED WORKFORCE REQUIREMENTS form, pages 491 to 494, **DELETE** in its entirety.

James Nagelvoort, Director
Public Works Department

Dated: *May 21, 2019*
San Diego, California

JN/RWB/mlw

City of San Diego

CITY CONTACT: Brittany Friedenreich, Senior Contract Specialist, Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM D



FOR

MONTEZUMA PPL/MID-CITY PIPELINE PH2 AND 70TH-ALVARADO TO SARANAC-SIDEWALK

BID NO.: K-19-1821-DBB-3
SAP NO. (WBS/IO/CC): S-11026, B-17065
CLIENT DEPARTMENT: 2000, 2116
COUNCIL DISTRICT: 7, 9
PROJECT TYPE: KA, IK

BID DUE DATE:

**2:00 PM
JUNE 19, 2019**

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



Registered Engineer
(Montezuma PPL/Mid-City Pipeline Ph 2)

5/23/19

Date

Seal:





For City Engineer
(Montezuma PPL/Mid-City Pipeline Ph 2)

5/23/19

Date

Seal:



A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

THE SUBMITTAL DATE FOR THIS PROJECT HAS BEEN **EXTENDED AS STATED ON THE COVER PAGE.**

B. ADDITIONAL CHANGES

- The following are additional changes to the Line Items in the PlanetBids Tab:
For clarity where applicable, **ADDITIONS**, if any, have been **Underlined** and **DELETIONS**, if any, have been **Stricken-out.**

Section	Item Code	Description	UoM	Qty	Payment Reference
Main Bid <u>Main Bid</u> Montezuma PPL/Mid-City Pipeline Ph2	237310	Asphalt Pavement Repair	TON	1850 <u>180</u>	301-1.7
Main Bid <u>Main Bid</u> Montezuma PPL/Mid-City Pipeline Ph2	238910	Concrete Pavement Replacement (8 Inch thick)	CY	22.7160 <u>23</u>	302-6.8
Alternate Items B	237310	Asphalt Pavement Repair (La Mesa)	TON	1020	301-1.7

James Nagelvoort, Director
Public Works Department

Dated: *May 24, 2019*
San Diego, California

JN/RWB/lad

City of San Diego

CITY CONTACT: Brittany Friedenreich, Senior Contract Specialist, Email: BFriedenreic@sandiego.gov
Phone No. (619) 533-3104

ADDENDUM E



FOR

MONTEZUMA PPL/MID-CITY PIPELINE PH2 AND 70TH-ALVARADO TO SARANAC-SIDEWALK

BID NO.: K-19-1821-DBB-3
SAP NO. (WBS/IO/CC): S-11026, B-17065
CLIENT DEPARTMENT: 2000, 2116
COUNCIL DISTRICT: 7, 9
PROJECT TYPE: KA, IK

BID DUE DATE:

**2:00 PM
JUNE 19, 2019**

CITY OF SAN DIEGO'S ELECTRONIC BIDDING SITE, PLANETBIDS

<http://www.sandiego.gov/cip/bidopps/index.shtml>

ENGINEER OF WORK

The engineering Specifications and Special Provisions contained herein have been prepared by or under the direction of the following Registered Engineer:



6/4/19

Seal:

1) Registered Engineer

Date



6/4/19

Seal:

2) For City Engineer

Date



A. CHANGES TO CONTRACT DOCUMENTS

The following changes to the Contract Documents are hereby made effective as though originally issued with the bid package. Bidders are reminded that all previous requirements to this solicitation remain in full force and effect.

B. BIDDER'S QUESTIONS

Q1. Subject: Bid Item 91 – Electrical Work, Discipline Code E-2, Plan Sheet 66

The detail for “Proposed Conduit to Vault No. 3 and Flowmeter Manhole” includes the note “SEE CIVIL SHEET 42 FOR CONTINUATION” in two locations. The Bid Documents do not include a Discipline Code C-42 drawing, and plan sheet 37333-42-D only contains details related to street resurfacing of Lake Murray Boulevard. Per the Conduit Schedule on E-4, these notes relate to conduit runs, that cannot be estimated as currently depicted in the bidding documents. Are these conduit runs 10, 100, or 1,000 feet or more? Please clarify so this scope of work can be quantified and competitively bid.

A1. A typo was made on sheet E-2. The continuation of that Fiber Optic line begins on sheet C-7 (sheet 21). The conduit then follows the alignment of the pipeline until the beginning where it connects to Phase 2A on sheet C-1 (sheet 15). For lengths of the conduit once on the Alvarado Water Treatment Plant site, the single line diagram on sheet C-24 (sheet 38) can be referenced. However, the drawing on E-2 is scaled and can be used to estimate lengths in that area as well whereas the single line diagram is schematic. Please see Section D of this Addendum for revised drawing of sheet E-2 (sheet 66).

Q2. Subject: Bid item 74 – Insertion Flow Meter

The Bid Item Quantity is 2 each. We can only find one location (Sta. 57+08) requiring the Insertion Flow Meter required by Technical Specification 13414. There does not appear to be an intention in the specifications to provide a spare meter. This is an approximately \$50,000 item. Please clarify the location of the 2 insertion flow meter so the actual quantity of work can be quantified and competitively bid.

A2. It is confirmed that there is only 1 insertion flow meter in this project, which is located at Station 57+08.

- Q3. Subject: Bid Items 29 and 106 – Tree Removal (24-inch Diameter and Greater) (7 total)

Removal of specific trees or locations is not identified on the plans. This prevents an opportunity to visit the site, identify the exact size of the tree, observe constraints for safe removal, and reasonably estimate the cost and provide a competitive bid. Please specifically identify the trees or proximate location of the trees to be removed.

- A3. Item 29 is for 2 trees per C-17 (sheet 31); Item 106 is for tree removals on Lake Murray Blvd. on medians per LM-11 and LM-12 (sheets 88 and 89)

C. ADDITIONAL CHANGES

1. The following are additional changes to the Line Items in the PlanetBids Tab:

For clarity where applicable, **ADDITIONS**, if any, have been **Underlined** and **DELETIONS**, if any, have been **~~Stricken out.~~**

Section	Item Code	Description	UoM	Quantity	Payment Reference
Main Bid Montezuma PPL/Mid- City Pipeline Ph2	237110	Insertion Flow Meter	EA	2 <u>1</u>	306-15.8

D. PLANS

- To Drawing Sheet 37333-01-D (Sheet G-1) **DELETE** in its entirety and **REPLACE** with page 6 of this Addendum.
- To Drawing Sheet 37333-66-D (Sheet E-2) **DELETE** in its entirety and **REPLACE** with page 7 of this Addendum.
- To Drawing Sheet 37333-86-D (Sheet LM-9) **DELETE** in its entirety and **REPLACE** with page 8 of this Addendum.

4. To Drawing Sheets 37333-T1-D, 37333-T20-D, 37333-T22-D, 37333-T26-D, 37333-T67-D through 37333-T70-D, **DELETE** in its entirety and **REPLACE** with pages 9 through 16 of this addendum.

James Nagelvoort, Director
Public Works Department

Dated: *June 7, 2019*
San Diego, California

JN/RWB/cc

CONTRACTOR'S RESPONSIBILITIES

1. PURSUANT TO SECTION 4216 OF THE CALIFORNIA GOVERNMENT CODE, AT LEAST 2 WORKING DAYS PRIOR TO EXCAVATION, YOU MUST CONTACT THE REGIONAL NOTIFICATION CENTER (E.G., UNDERGROUND SERVICE ALERT OF SOUTHERN CALIFORNIA) AND OBTAIN AN INQUIRY IDENTIFICATION NUMBER.
2. NOTIFY SDG&E AT LEAST 10 WORKING DAYS PRIOR TO EXCAVATING WITHIN 10' OF SDG&E UNDERGROUND HIGH VOLTAGE TRANSMISSION POWER LINES. (I.E., 69 KV & HIGHER)
3. LOCATE AND RECONNECT ALL SEWER LATERALS. LOCATIONS AS SHOWN ON THE PLANS ARE APPROXIMATE ONLY. LATERAL RECORDS ARE AVAILABLE TO THE CONTRACTOR AT THE WATER DEPARTMENT, 2797 CAMINITO CHOLLAS. LOCATE THE IMPROVEMENTS THAT WILL BE AFFECTED BY LATERAL REPLACEMENTS.
4. EXCAVATE AROUND WATER METER BOX (CITY PROPERTY SIDE) TO DETERMINE IN ADVANCE THE SIZE OF EACH SERVICE BEFORE TAPPING MAIN.
5. CITY FORCES, WHEN SPECIFIED OR SHOWN ON THE PLANS, WILL MAKE PERMANENT CUTS & PLUGS AND CONNECTIONS.
6. KEEP EXISTING MAINS IN SERVICE IN LIEU OF HIGH-LINING, UNLESS OTHERWISE SPECIFIED SHOWN ON PLANS.
7. THE LOCATIONS OF EXISTING BUILDINGS AS SHOWN ON THE PLAN ARE APPROXIMATE.
8. STORM DRAIN INLETS SHALL REMAIN FUNCTIONAL AT ALL TIMES DURING CONSTRUCTION.
9. UNLESS OTHERWISE NOTED AS PREVIOUSLY POTHOLED (PH), ELEVATIONS SHOWN ON THE PROFILE FOR EXISTING UTILITIES ARE BASED ON A SEARCH OF THE AVAILABLE RECORD INFORMATION ONLY AND ARE SOLELY FOR THE CONTRACTOR'S CONVENIENCE. THE CITY DOES NOT GUARANTEE THAT IT HAS REVIEWED ALL AVAILABLE DATA. THE CONTRACTOR SHALL POTHOLE ALL EXISTING UTILITIES EITHER SHOWN ON THE PLANS OR MARKED IN THE FIELD IN ACCORDANCE WITH THE SPECIFICATIONS SECTION 5-UTILITIES.
10. EXISTING UTILITY CROSSINGS AS SHOWN ON THE PLANS ARE APPROXIMATE AND ARE NOT REPRESENTATIVE OF ACTUAL LENGTH AND LOCATION OF CONFLICT AREAS. SEE PLAN VIEW.
11. ALL ADVANCE METERING INFRASTRUCTURE (AMI) DEVICES ATTACHED TO THE WATER METER OR LOCATED IN OR NEAR WATER METER BOXES, COFFINS, OR VAULTS SHALL BE PROTECTED AT ALL TIMES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
12. NO JOINTS SHALL BE WITHIN 8' OF CROSSING UTILITIES CONVEYING LIQUIDS OR PARALLEL UTILITIES CONVEYING LIQUIDS THAT ARE 4' OR CLOSER (OUTSIDE PIPE WALL TO OUTSIDE PIPE WALL).
13. PROVIDE HOLIDAY FREE LININGS AND COATING FOR VALVES PER AWWA C550. HOLIDAYS CANNOT BE FIELD REPAIRED AND MUST BE REPAIRED IN A FACILITY APPROVED BY THE MANUFACTURER. IF HOLIDAYS EXIST ONLY ON THE EXTERIOR SURFACE, THE CONTRACTOR HAS THE OPTION OF APPLYING WAX TAPE TO THE ENTIRE VALVE PER AWWA C217.
14. PROVIDE HOLIDAY FREE COATINGS FOR DI FITTINGS WITH THE REQUIRED 24 MIL DFT PER WHITEBOOK 209-1.1.2, OTHERWISE THE FITTINGS WILL HAVE TO BE WAX TAPED PER AWWA C217.
15. FOR COORDINATION OF THE SHUTDOWN OF TRANSMISSION MAINS (16-INCHES AND LARGER), CONTACT THE CITY'S SENIOR WATER DISTRIBUTION OPERATIONS SUPERVISOR AT (619) 527-7438. FOR COORDINATION OF THE SHUTDOWN OF DISTRIBUTION MAINS (LESS THAN 16-INCHES), CONTACT THE CITY'S WATER OPERATIONS MANAGER AT (619) 527-3945.

CONSTRUCTION STORM WATER PROTECTION NOTES

1. TOTAL SITE DISTURBANCE AREA (ACRES) 1.11 AC
 HYDROLOGIC UNIT/WATERSHED PUEBLO SAN DIEGO & SAN DIEGO
 HYDROLOGIC SUBAREA NAME & NO. CHOLLAS/908.22 & MISSION SAN DIEGO/907.11
2. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THE
 WPCP
 THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NO. R9-2013-0001 AS AMENDED BY R9-2015-0001 AND R9-2015-0100
 SWPPP
 THE PROJECT IS SUBJECT TO MUNICIPAL STORM WATER PERMIT NO. R9-2013-0001 AS AMENDED BY R9-2015-0001 AND R9-2015-0100 AND CONSTRUCTION GENERAL PERMIT ORDER 2009-0009-DWQ AS AMENDED BY ORDER 2010-0014-DWQ AND 2012-0006-DWQ
 TRADITIONAL RISK LEVEL 1 2 3
 LUP: RISK TYPE 1 2 3
3. CONSTRUCTION SITE PRIORITY
 ASBS HIGH MEDIUM LOW

MONUMENTATION/SURVEY NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR SURVEY MONUMENTS AND/OR VERTICAL CONTROL BENCHMARKS WHICH ARE DISTURBED OR DESTROYED BY CONSTRUCTION. A LICENSED LAND SURVEYOR OR LICENSED CIVIL ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING IN THE STATE OF CALIFORNIA SHALL FIELD LOCATE, REFERENCE, AND/OR PRESERVE ALL HISTORICAL OR CONTROLLING MONUMENTS PRIOR TO ANY EARTHWORK, DEMOLITION OR SURFACE IMPROVEMENTS. IF DESTROYED, A LICENSED LAND SURVEYOR SHALL REPLACE SUCH MONUMENT(S) WITH APPROPRIATE MONUMENTS. WHEN SETTING SURVEY MONUMENTS USE FOR RE-ESTABLISHMENT OF THE DISTURBED CONTROLLING SURVEY MONUMENTS AS REQUIRED BY SECTIONS 6730.2 AND 8771 OF THE BUSINESS AND PROFESSIONS CODE OF THE STATE OF CALIFORNIA. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED WITH THE COUNTY SURVEYOR. IF ANY VERTICAL CONTROL IS TO BE DISTURBED OR DESTROYED, THE CITY OF SAN DIEGO FIELD SURVEY SECTION SHALL BE NOTIFIED IN WRITING AT LEAST 7 DAYS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF REPLACING ANY VERTICAL CONTROL BENCHMARKS DESTROYED BY THE CONSTRUCTION.

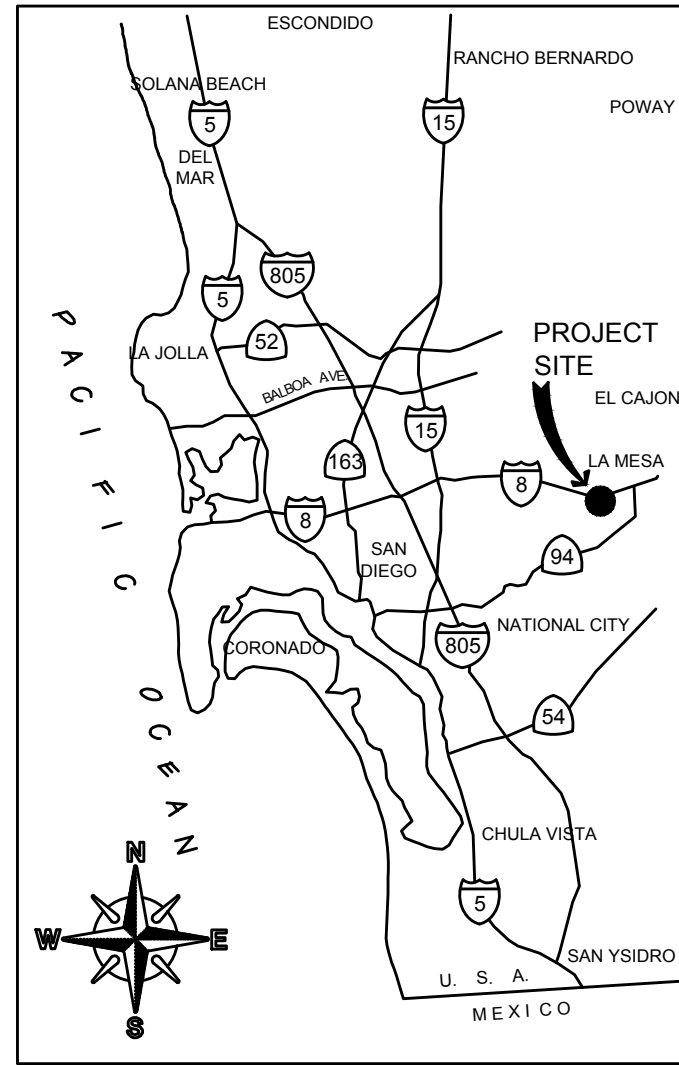
WORK TO BE DONE

1. CONSTRUCTION OF NEW 66" CMLC&TC TRANSMISSION MAIN WITH CATHODIC PROTECTION, NEW 8" PVC DISTRIBUTION MAIN, WATER SERVICES, 2-4" FIBER OPTIC CONDUITS, EXISTING 16" WATER MAIN ABANDONMENT, STREET RESURFACING, CURB RAMPS AND ALL OTHER WORK SHOWN ON THESE PLANS AND SPECIFICATIONS.

MONTEZUMA PPL / MID-CITY PIPELINE PH2

ABBREVIATIONS

ABAND	ABANDON	IJS	INSULATING JOINT TEST STATION
ABAND'D	ABANDONED	IRR	IRRIGATION
ACP	ASBESTOS CEMENT (PIPE)	LT	LEFT
AC	ASPHALTIC CONCRETE	MJ	MECHANICAL JOINT
AHD	AHEAD	MPBX	MULTI-POINT BOREHOLE EXTENSOMETER
AWTP	ALVARADO WATER TREATMENT PLANT	MTD	MULTIPLE TELEPHONE DUCT
ASSY	ASSEMBLY	MTBM	MICROTUNNEL BORING MACHINE
AVAR	AIR VACUUM & AIR RELEASE	MTS	METROPOLITAN TRANSIT SYSTEM
AWWA	AMERICAN WATER WORKS ASSOC	N.I.C.	NOT IN CONTRACT
BFV	BUTTERFLY VALVE	N/O	NORTH OF
BK	BACK	OVHD	OVERHEAD
BO	BLOWOFF	PE	PLAIN END
BOP	BOTTOM OF PIPE	PH	POT HOLE
BTWN	BETWEEN	PROP	PROPOSED
BW	BACK OF WALK	PVC	POLYVINYL CHLORIDE (PIPE)
CATV	CABLE TV	PVMT	PAVEMENT
CC	CALCIUM CHLORIDE	RCB	REINFORCED CONCRETE BOX
CI	CAST IRON	RCCP	REINFORCED CONCRETE CYLINDER PIPE
CICL	CAST IRON CEMENT LINED	RCP	REINFORCED CONCRETE PIPE
CML&C	CEMENT MORTAR LINED STEEL PIPE WITH CEMENT MORTAR OVERCOAT	RCSC	REINFORCED CONCRETE STEEL CYLINDER
CML&TC	CEMENT MORTAR LINED AND TAPE COATED STEEL PIPE WITH CEMENT MORTAR OVERCOAT	RED	REDUCER
COND	CONDUIT	R.O.S.	RECORD-OF-SURVEY
CONT	CONTINUED	RT	RIGHT
CONTR	CONTRACTOR	SD	STORM DRAIN
CPTS	CATHODIC PROTECTION TEST STATION	SDCW	SAN DIEGO COUNTY WATER AUTHORITY
DB	DIRECT BURIED	SDD	SAN DIEGO STANDARD DRAWINGS
DI	DUCTILE IRON	SHT	SHEET
EB	ENCASED BURIED	SL	SEWER LATERAL
ECC	ECCENTRIC	SO	STUB OUT
EG	EXISTING GRADE	S/O	SOUTH OF
EL, ELEV	ELEVATION	SS	STAINLESS STEEL
ELEC	ELECTRIC	SSMH	SANITARY SEWER MANHOLE
ESMT	EASEMENT	STL	STEEL
EX, EXIST	EXISTING	SWR	SEWER
E/O	EAST OF	TC	TOP OF CURB
F	FLANGE	TEL	TELEPHONE
FCF	FLOW CONTROL FACILITY	TP	TOP OF PIPE
FH	FIRE HYDRANT	TYP	TYPICAL
FL	FLOW LINE	UNK	UNKNOWN
FS	FINISHED SURFACE	VC	VITRIFIED CLAY (PIPE)
GV	GATE VALVE	VERT	VERTICAL
HDPE	HIGH DENSITY POLYETHYLENE	WAS	WATER AGENCY STANDARDS
HP	HIGH PRESSURE	WD	WATER DISTRICT
HSS	HEAT SHRINK SLEEVE	WS	WATER SERVICE
HWD	HELIX WATER DISTRICT	WTR	WATER
IE	INVERT ELEVATION	WWM	WELDED WIRE MESH
		W/O	WEST OF



VICINITY MAP
NOT TO SCALE

FIELD DATA

BENCHMARK:
 NWBP SARANAC STREET AND 69TH STREET, ELEV. 460.779 MSL, BASED ON NGVD 29 FEET AS SHOWN IN THE CITY OF SAN DIEGO BENCH BOOK.

CITY OF SAN DIEGO PRELIMINARY SURVEY FIELD NOTES:
 MID-CITY PIPELINE PHASE II, WATKINS, 218-1752, WO. S-11026, 7/10/2013

DATE: MEAN SEA LEVEL, NGVD 29

BASIS OF BEARINGS:
 THE BASIS OF BEARINGS FOR THIS PROJECT WAS DERIVED FROM A PREVIOUS STATIC GPS SURVEY USING ROS 14492, NAD 83 FEET, ZONE 6 (EPOCH 91.35), UTILIZING RTK/GPS FIELD PROCEDURES WITH A CALVRS BASE STATION BROADCAST 2013 AND CONSTRAINING TO GPS 17, GPS 1108 CHECKING GPS 1105, I.E. S 59°07'28" E.

HELIX WATER DISTRICT
W.O. 4515

ACCEPTED BY: JAMES A. TOMASULO DATE
 DIRECTOR OF ENGINEERING

PLATS H-1-13-C, H-1-24-B

CITY OF LA MESA

REVIEWED BY: RICHARD B. LEJA DATE
 R.C.E. 50279
 DIRECTOR OF PUBLIC WORKS/
 CITY ENGINEER

CONSULTANT

PSOMAS

401 B Street, Suite 1600
 San Diego, CA 92101
 (619) 961-2800 (619) 961-2392 fax
 www.psomas.com

PLANS FOR THE CONSTRUCTION OF
MONTEZUMA PPL / MID-CITY PIPELINE PH2

COVER SHEET

LEGEND

IMPROVEMENTS	REFERENCE	SYMBOL
TRENCH RESURFACING	(SEE DETAILS ON SHT 27)	
PIPE SUPPORT FOR UNDERCUT AC WATER MAIN	SDW-162	
CUTTING AND PLUGGING ABANDONED WATER MAIN	WP-03	
WATER MAIN & APPURTENANCES	SDM-105, SDW-10, SDW-103, SDW-108, SDW-110, SDW-111, SDW-116, SDW-139, SDW-151 (1500 PSF, 225 PSI)	
VALVES WITH CAPS AND WELLS	SDW-109, SDW-152, SDW-153, SDW-154, WV-05	
ACCESS MANWAY IN CONCRETE STRUCTURE	D-9, M-3, SDD-114, SDM-113, SDW-103	
6" FIRE HYDRANT ASSEMBLY & MARKER 2-PORT UNLESS SPECIFIED AS 3-PORT	SDM-105, SDW-104, SDW-109, SDW-152, SDW-153	
1" WATER SERVICE UNLESS OTHERWISE SPECIFIED	SDM-105, SDW-107, SDW-134, SDW-135, SDW-136, SDW-137, SDW-138, SDW-149, SDW-150, WS-03	
WATER SERVICE TRANSFER	SDW-149, SDW-150	
BLOWOFF ASSEMBLY	SDM-105, SDW-106, SDW-143, SDW-144, SDW-145, SDW-146, WB-05	
AIR VACUUM & AIR RELEASE VALVE	SDM-105, SDW-117, SDW-160	
HIGHLINING BY CONTRACTOR	SDW-170, SDW-171, SDW-172, SDW-173	
2-4" FIBER OPTIC CONDUITS AND PULLBOX	SDM-105	
WATER MAIN STEEL CASING		
CATHODIC PROTECTION TEST STATION	SDM-105, SDW-121, SDW-128, SDW-129, SDW-130, SDW-131, SDW-132, SDW-133	
SURVEY WELL MONUMENT	M-10, M-10A, M-10B	
SURVEY MONUMENT		
FOR ADDITIONAL SYMBOLS SEE RESURFACING, CURB RAMP, AND TRAFFIC CONTROL SHEETS.		

EXISTING STRUCTURES

WATER MAIN & VALVES		FENCE	
WATER METER/SERVICE LINE		RIGHT-OF-WAY	
FIRE HYDRANT		CALTRANS RIGHT-OF-WAY	
SEWER MAIN & MANHOLES		ELECTRIC VAULT/PEDESTAL	
STORM DRAINS		LIGHT FIXTURE	
AC PAVEMENT (PROFILE)		IRRIGATION CONTROL BOX	
GROUND LINE (PROFILE)		WATER VAULT/MANHOLE	
CONCRETE SURFACE (PROFILE)		POWER POLE	
TRAFFIC SIGNAL		GAS VALVE	
STREET LIGHT		MONITORING WELL	
GAS MAIN		TRAFFIC SIGNAL PULLBOX	
ELEC, TEL, OR CATV CONDUIT		TELEPHONE VAULT/PEDESTAL	
SEWER FORCE MAIN		BACKFLOW DEVICE	
RAILROAD, TROLLEY TRACKS			

SPEC NO. 1821

APPROVED: Brian Vitelle 3/20/2019
 FOR CITY ENGINEER DATE
 BRIAN VITELLE C73039
 PRINT DGE NAME RCE #

SEAL: **ERIC B. MAGEE**
 REGISTERED PROFESSIONAL ENGINEER
 CIVIL
 No. 64566 Exp. 6/30/19
 STATE OF CALIFORNIA

CITY OF SAN DIEGO, CALIFORNIA
 PUBLIC WORKS DEPARTMENT
 SHEET 1 OF 89 SHEETS

WATER WBS S-11026
 SEWER WBS N/A

APPROVED BY: MARYAM KARGAR
 PROJECT MANAGER
 CHECKED BY: JACOB RIVERA
 PROJECT ENGINEER

DESCRIPTION	BY	APPROVED	DATE	FILMED
ORIGINAL	PSO			
ADDENDUM A2	PSO	<u>Brian Vitelle</u>	5/1/19	
ADDENDUM E	PSO	<u>Brian Vitelle</u>	6/4/19	

CONTRACTOR: PSOMAS DATE STARTED: 1/14/19
 INSPECTOR: _____ DATE COMPLETED: _____

SEE SHEETS
 CCS27 COORDINATE
 SEE SHEETS
 CCS83 COORDINATE

CONSTRUCTION CHANGE / ADDENDUM			
CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.
	5/8/19	CP-1 (37333-70-D), CP-3 (37333-72-D)	
	5/30/19	E-2 (37333-66-D), LM-9(37333-86-D)	

WARNING

0 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



AS-BUILT INFORMATION

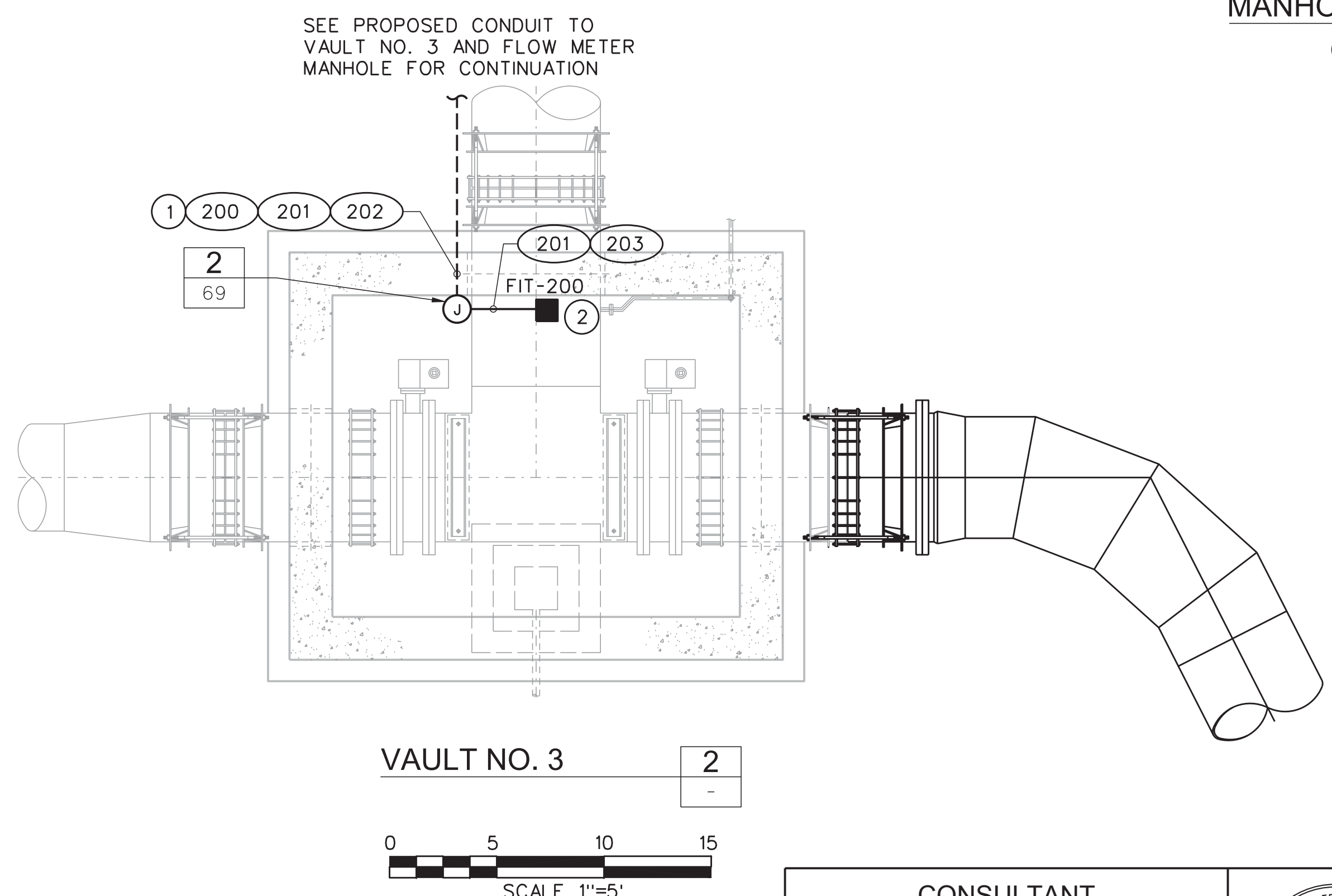
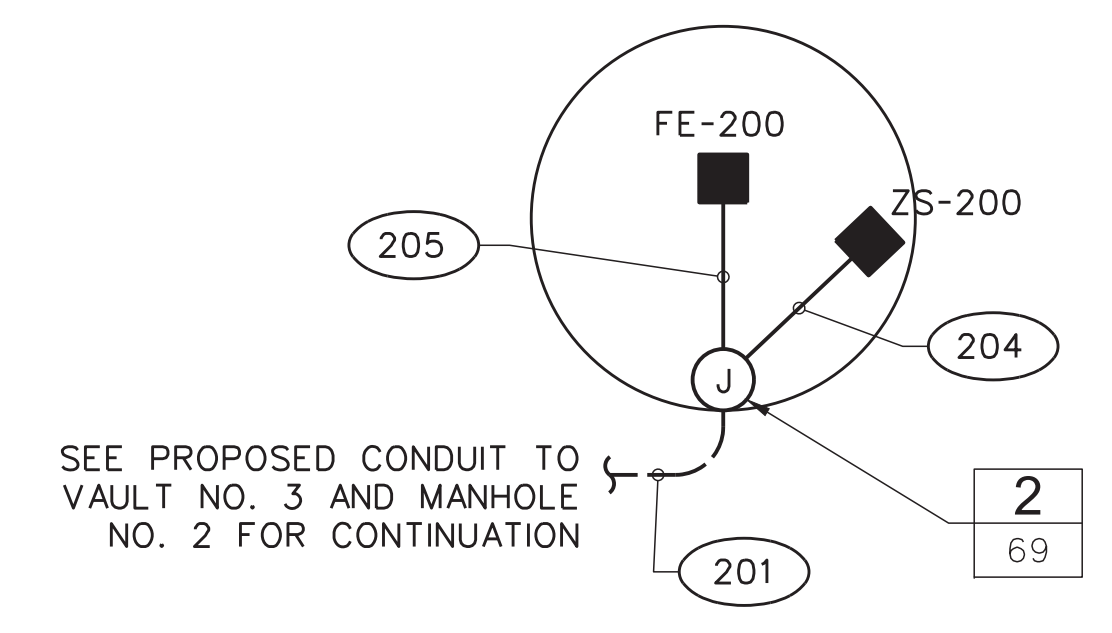
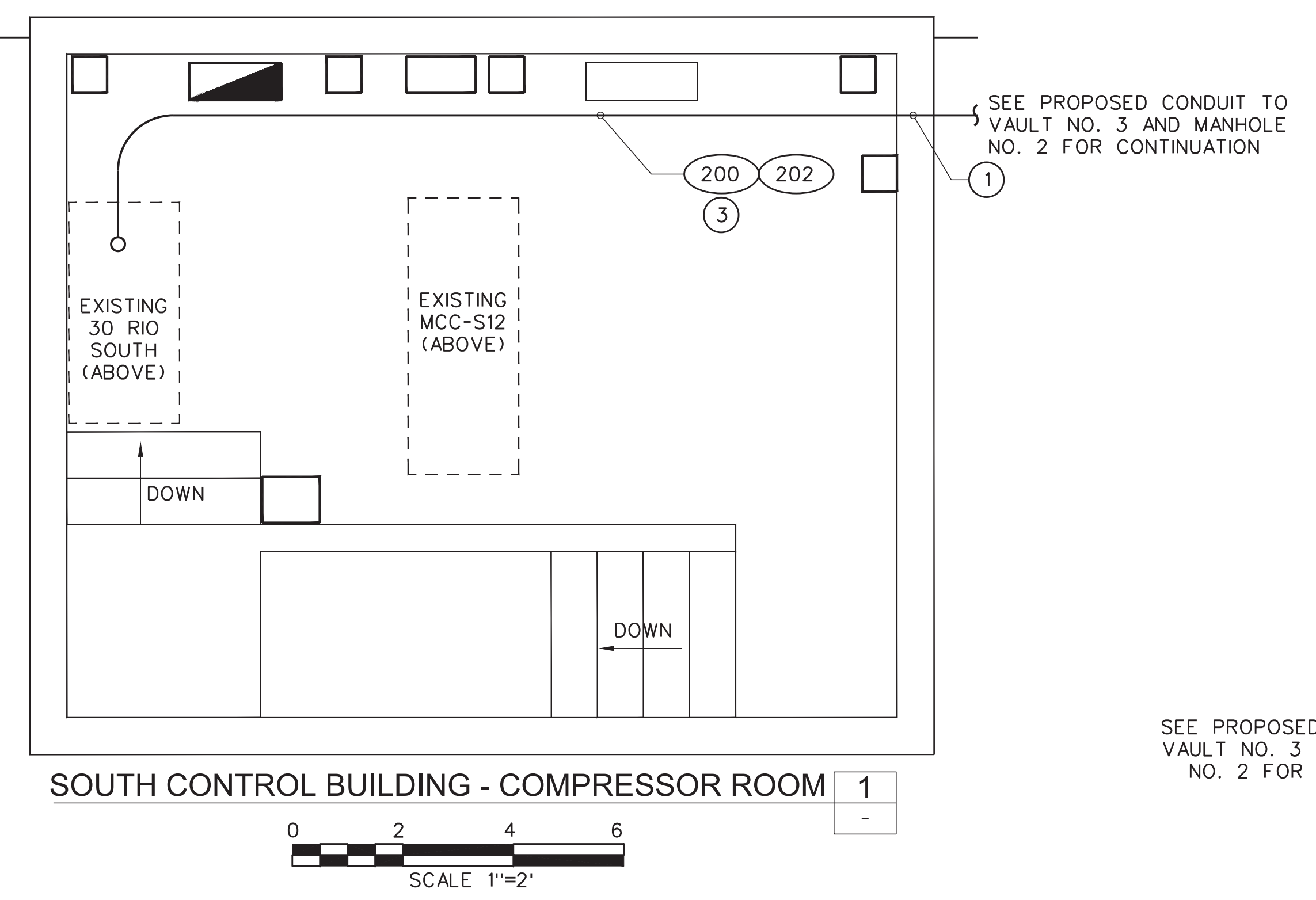
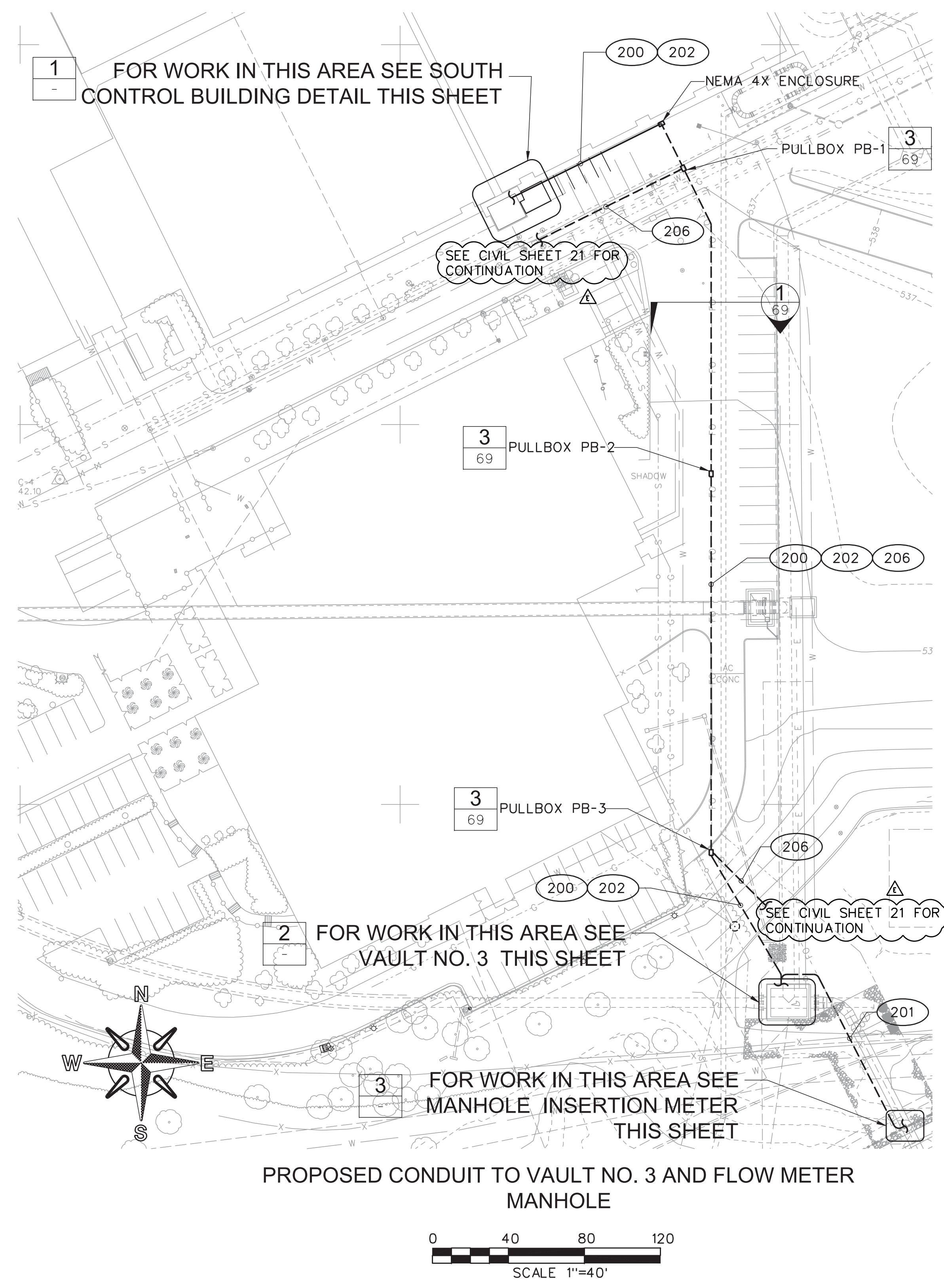
MATERIALS	MANUFACTURER
PIPE WELDED STEEL (WATER)	-
PIPE CL 235 PVC (WATER)	-
PIPE SDR 35 PVC (SEWER)	-
BUTTERFLY VALVES	-
GATE VALVES	-
	-
	-

CONTRACTOR: PSOMAS DATE STARTED: 1/14/19
 INSPECTOR: _____ DATE COMPLETED: _____

NO CHANGES TO THIS SHEET

ADDENDUM E

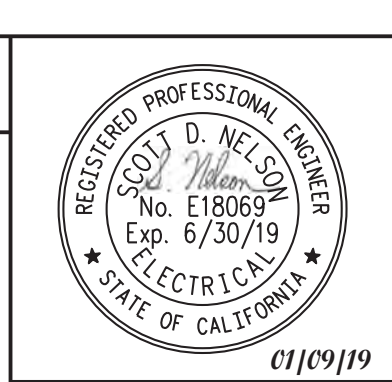
MONTEZUMA PPL / MID-CITY PIPELINE PH2



- NOTES:**
- ① CORE DRILL AND PATCH THE WALL FOR CONDUIT PENETRATIONS (TYPICAL).
 - ② MOUNT FIT-200 AT EYE LEVEL ABOVE THE EXISTING PLATFORM INSIDE THE VAULT.
 - ③ TERMINATE THE POWER, CONTROL, AND SIGNAL CONDUCTORS IN CONDUIT 200 PER THE CITY'S DIRECTIONS. SEE SECTION 13374 FOR PROGRAMMING REQUIREMENTS.

MPA MORAES/PHAM & ASSOCIATES
 CONSULTING ELECTRICAL & MECHANICAL ENGINEERS
 2131 PALOMAR AIRPORT RD., STE. 120
 CARLSBAD, CA 92011 (760) 431-7177

CONSULTANT
PSOMAS
 401 B Street, Suite 1600
 San Diego, CA 92101
 (619) 961-2800 (619) 961-2392 fax
 www.psomas.com

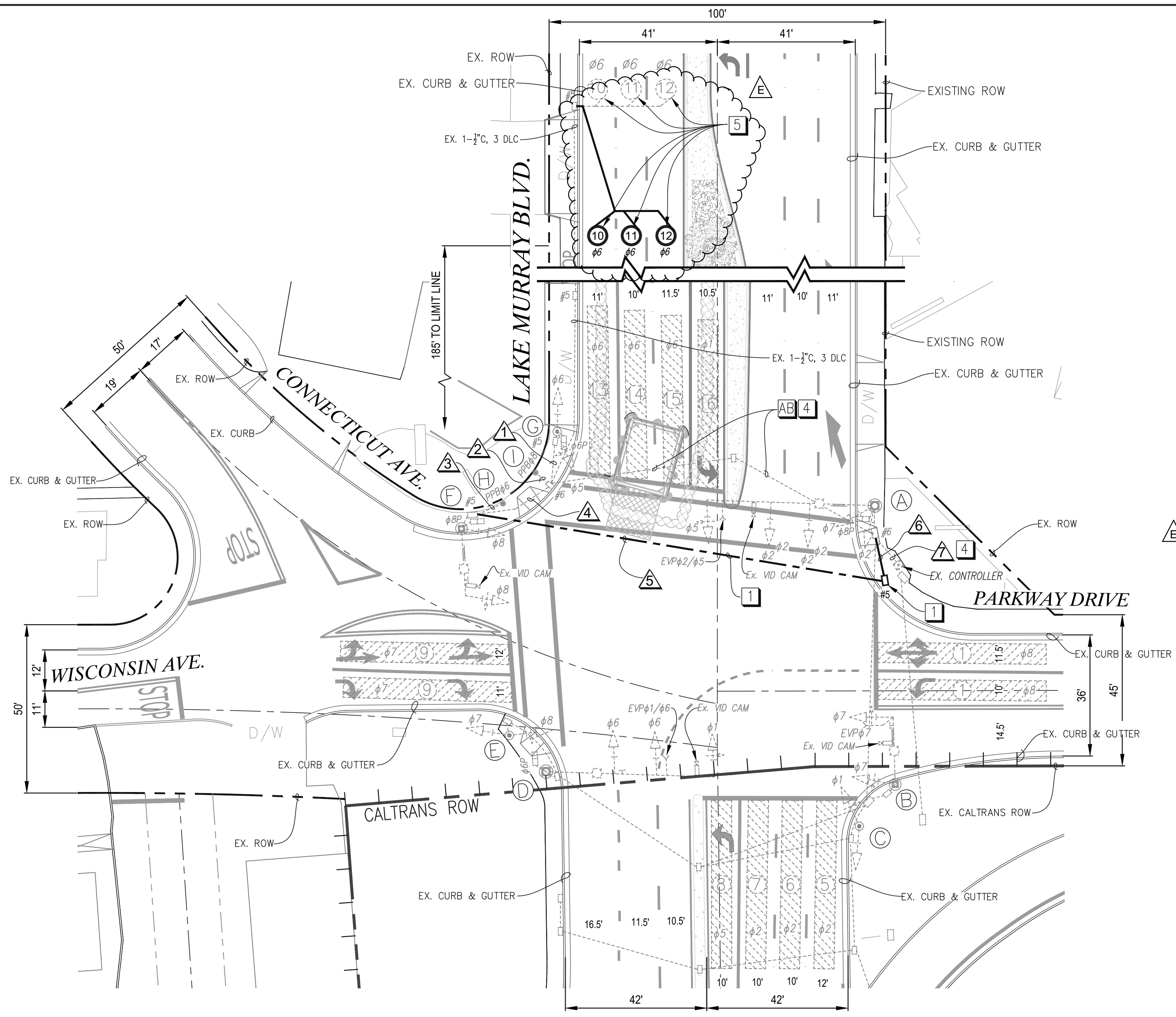
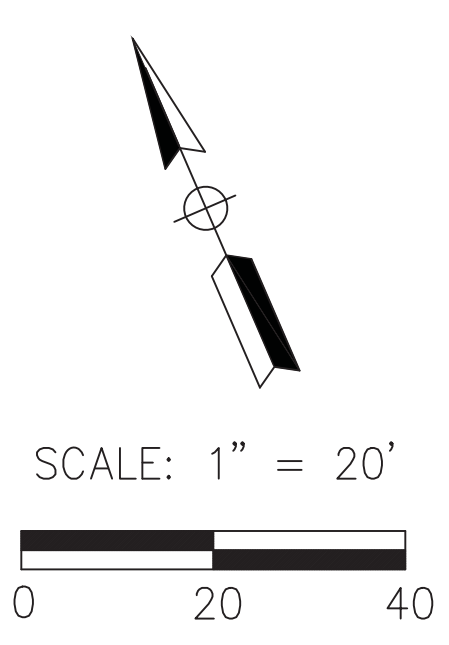
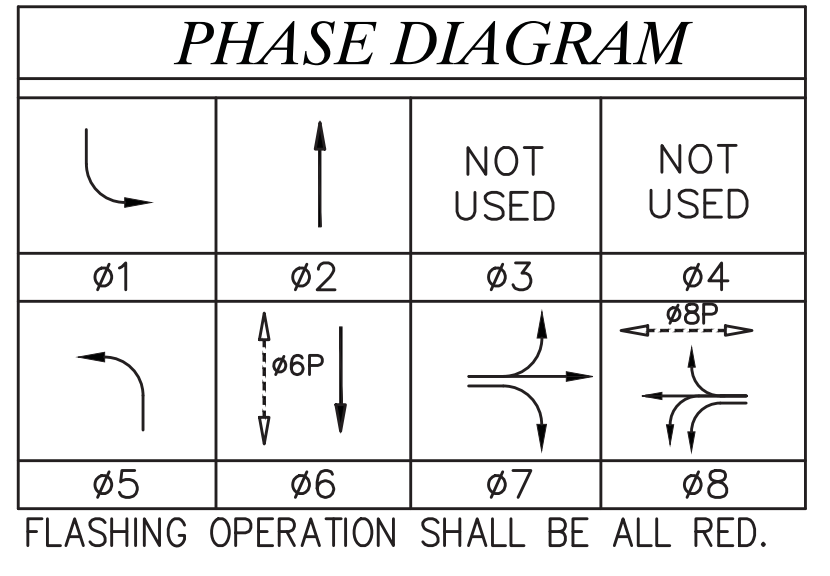


MONTEZUMA PPL / MID-CITY PIPELINE PH2			
ELECTRICAL SITE PLAN - VAULT NO. 3 AND FLOW METER MANHOLE			
CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 66 OF 89 SHEETS		WATER WBS S-11026 SEWER WBS N/A	
APPROVED FOR CITY ENGINEER BRIAN VITELLE PRINT DCE NAME	DATE 03/20/2019 C73039 RCE #	SUBMITTED BY MARYAM KARGAR PROJECT MANAGER CHECKED BY JACOB RIVERA PROJECT ENGINEER	
DESCRIPTION	BY	APPROVED	DATE FILMED
ORIGINAL	MPA		222-1755
ADDENDUM E	MPA	Brian Vitelle	6/4/19
			1862444, 6316407 CCS83 COORDINATE
CONTRACTOR INSPECTOR		DATE STARTED	DATE COMPLETED
			37333-66-D

CONDUCTOR TABLE *		CONDUIT SIZE & RUN						
AWG SIZE OR CABLE TYPE	POLE OR CIRCUIT	2" (E)	2" (E)	2" (E)	2" (E)	3" (N)	3" (N)	2-3" (E)
3#14 (N) (PPB)	POLE - F	-	-	-	-	-	-	-
5#14 (N) (PED HEAD)	POLE - G	-	-	-	-	-	-	-
(N)	POLE - H (PPB)	-	-	-	-	-	-	-
12#14 (SIGNAL)	POLE - I (PPB)	-	-	-	-	-	-	-
TOTAL CABLES	3 COND / 5 COND / 12 COND	-	-	-	-	-	-	-
#6	SIGNAL SERVICE							
#8	LUMINAIRE (N)					2(N)	2(N)	
#10	COMMON							1(E)
FIBER OPTIC	INTERCONNECT CABLE							
TYPE								
"B"	#6 ADV. LOOP DETECTORS (N)	3(N)				3(N)	3(N)	3(N)
DLC	TOTAL DLC	3(N)				3(N)	3(N)	3(N)
EVP CABLE								
#8	EVP (N)					1(N)	1(N)	1(N)
TOTAL EVP						1(N)	1(N)	1(N)
VIDEO (N) POWER						1(N)	1(N)	1(N)
VIDEO (N) COAX						1(N)	1(N)	1(N)
TOTAL VIDEO (N)						2(N)	2(N)	2(N)

(N) = NEW (E) = EXISTING

LAKE MURRAY BLVD. AT CONNECTICUT AVE. / PARKWAY DR. PHASE DIAGRAM



- TRAFFIC SIGNAL NOTES:**
- ALL PULL BOXES SHALL BE #5, AND HAVE THE WORDS "TRAFFIC SIGNAL" ON THE COVER, AND CONDUIT SHALL BE AS SHOWN IN THE CONDUCTOR AND CONDUIT SCHEDULE.
 - ALL TRAFFIC SIGNAL EQUIPMENT AND CONSTRUCTION SHALL CONFORM TO CALIFORNIA DEPARTMENT OF TRANSPORTATION STANDARD DRAWINGS, SPECIFICATIONS AND IN CONFORMANCE WITH THE MUTCD, UNLESS EQUIPMENT IS SUPPLIED OR OTHERWISE SPECIFIED BY THE CITY OF LA MESA (SEE SPECIFICATIONS).
 - CONDUCTOR SCHEDULE IS FURNISHED AS AN INSTALLATION GUIDELINE ONLY. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE THE CORRECT CONDUCTORS REQUIRED FOR THE INTENDED OPERATION.
 - CONTRACTOR SHALL SUBMIT A TRAFFIC CONTROL PLAN FOR TRAFFIC SIGNAL INSTALLATION PER CALTRANS MUTCD TO THE CITY OF LA MESA ENGINEERING SERVICES DIVISION A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO CONSTRUCTION.
 - FLASHING SIGNAL OPERATION SHALL BE RED ON ALL PHASES. PEDESTRIAN HEADS SHALL BE BLANK DURING FLASHING OPERATION.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR ANY MONUMENTS AND/OR BENCHMARKS WHICH WILL BE DISTURBED OR DESTROYED BY CONSTRUCTION. SUCH POINTS SHALL BE REFERENCED AND REPLACED WITH APPROPRIATE MONUMENTS BY A LICENSED LAND SURVEYOR OR A REGISTERED CIVIL ENGINEER AUTHORIZED TO PRACTICE LAND SURVEYING. A CORNER RECORD OR RECORD OF SURVEY, AS APPROPRIATE, SHALL BE FILED BY THE LICENSED LAND SURVEYOR OR REGISTERED CIVIL ENGINEER AS REQUIRED BY THE LAND SURVEYORS ACT.
 - CONTRACTOR IS RESPONSIBLE FOR ABANDONING EXISTING CONDUITS, AND REMOVING ALL EXISTING CONDUCTORS AND FOR INSURING THAT FIBER OPTIC CONNECTIONS ARE OPERATIONAL AFTER CONSTRUCTION IS COMPLETE.
 - INSTALL W 3-3 & W20-1 SIGNS ON ALL APPROACHES AS PART OF THE TRAFFIC CONTROL PLAN (300' BACK) DURING CONSTRUCTION. REMOVE SIGNS AFTER CONSTRUCTION IS COMPLETED.
 - CONTRACTOR IS RESPONSIBLE FOR MAINTAINING AND PROTECTING ALL UTILITIES DURING CONSTRUCTION.
 - ANY CONCRETE SIDEWALK MODIFIED OR DAMAGED AS A RESULT OF CONSTRUCTION MUST HAVE THE ENTIRE PANEL REPLACED FROM JOINT TO JOINT.
 - CONTRACTOR SHALL PLAN A PRE-CONSTRUCTION MEETING WITH CALTRANS SIGNAL OPERATIONS (SHERI BABAKI, 619-954-8570) PRIOR TO THE START OF THE PROJECT.
 - CONTACT CALTRANS SIGNAL OPERATIONS (SHERI BABAKI) AND ELECTRICAL MAINTENANCE (MARTIN ESCALANTE, 619-572-3410) FIVE DAYS PRIOR TO START OF WORK FOR EACH PHASE OF THE PROJECT.

CONSTRUCTION NOTES

- FURNISH & INSTALL #5 PULLBOX AND 3" CONDUIT WHERE SHOWN ON THE PLAN.
- INSTALL CONDUCTORS FROM CONTROLLER THRU ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, & ⑩ PER CONDUCTOR SCHEDULE SHOWN AT TOP LEFT.
- CONTRACTOR SHALL REMOVE ABANDONED CONDUCTORS IN ⑦ & ⑧ CONDUIT RUNS.
- CONTRACTOR IS RESPONSIBLE FOR ABANDONING ALL NOTED EXISTING CONDUIT RUNS IN PLACE ⑧. REMOVE AND DISPOSE OF EXISTING WIRES / CONDUCTORS / DLC'S BACK TO CONTROLLER APPROPRIATELY.
- CONTRACTOR TO ABANDON EXISTING #6 ADVANCE LOOP DETECTORS & INSTALL NEW LOOP DETECTORS 185 FEET FROM THE LIMIT LINE.



SCALE: 1" = 20'

PLANS PREPARED UNDER THE SUPERVISION OF:

Bill E. Darnell 5/13/2019 DATE

BILL E. DARNELL
DESIGN ENGINEER R.C.E. No. 22338
LICENSE EXPIRES 9-30-19

Darnell & ASSOCIATES, INC.
4411 MERCURY STREET, SUITE 207A
SAN DIEGO, CA 92111
(619) 233-9373

PROFESSIONAL ENGINEER
BILL E. DARNELL
No. 22338
CIVIL
STATE OF CALIFORNIA

WARNING
IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

DWG: 130801-Mid City Traf SG Plans-1B | DATE: May 13, 2019 | BY: DdB

RECORD DRAWING

INDEXED BY: _____

BY: _____ RCE: _____ DATE: _____

REVIEWED BY: _____ DATE: _____

CITY INSPECTOR

APPROVED: _____ DATE: _____

CITY ENGINEER

BENCHMARK DATA

DESCRIPTION: NWBP SARANAC STREET AND 69th STREET, ELEV. 460.779 MSL, BASED ON NGVD 29 FEET AS SHOWN IN THE CITY OF SAN DIEGO BENCH BOOK

RECORD FROM: CITY OF SAN DIEGO MID-CITY PIPELINE PHASE II, WATKINS, 218-1752, WO. S-11026, 7/10/2013

ELEVATION: 460.779 MSL DATUM: NGVD 29

LM-9

MONTEZUMA PPL / MID-CITY PIPELINE PH 2
TRAFFIC SIGNAL MODIFICATION PLAN FOR:

LAKE MURRAY BOULEVARD at CONNECTICUT AVE. / PARKWAY DR.
TO ACCOMMODATE TRAFFIC CONTROL
SIGNAL OPERATIONS DURING RECEIVING PIT CONSTRUCTION

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 86 OF 89 SHEETS	WATER WBS S-11026 SEWER WBS N/A
APPROVED: <i>B. Vitelle</i> 03/20/2019 FOR CITY ENGINEER BRUNO VITELLE DEPUTY CITY ENGINEER	DATE: 03/20/2019 RCE # C73039
FOR CITY ENGINEER MARIAM KARGAR PROJECT MANAGER	CHECKED BY: JACOB RIVERA PROJECT ENGINEER
DESCRIPTION: ORIGINAL	BY: D&A
DESCRIPTION: ADDENDUM E	BY: D&A
APPROVED: <i>B. Vitelle</i>	DATE: 6/4/19
222-1755 CCS27 COORDINATE	1862444, 6316407 CCS83 COORDINATE
CONTRACTOR INSPECTOR	DATE STARTED: _____ DATE COMPLETED: _____
	37333-86-D

CITY OF LA MESA
LA MESA, CALIFORNIA

TRAFFIC SIGNAL MODIFICATION PLANS FOR:
LAKE MURRAY BOULEVARD AT KIOWA DR. & CONNECTICUT AVE. / PARKWAY DR.

CITY OF LA MESA, CALIFORNIA - PUBLIC WORKS/ENGINEERING DIVISION
SHEET 9 OF 9 SHEETS

CITY ENGINEER	R.C.E. 50279	DATE	DIVISION HEAD
DESCRIPTION: ORIGINAL	BY: D&A	APPROVED: _____ DATE: _____	DESIGN ENGINEER
			222-1755 CONTROL CERTIFICATION
			1862444, 6316407 LAMBERT COORDINATES
UTILITIES: _____	DEVELOPMENT: _____	DATE: _____	PUBLIC WORKS: _____

TRAFFIC CONTROL NOTES

1. VALIDATION. THIS TRAFFIC CONTROL PLAN IS NOT VALID UNTIL WORK DATES ARE APPROVED. THE CONTRACTOR SHALL, PER SECTION 601-2 OF THE CITY SUPPLEMENT TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, CONTACT THE PUBLIC WORKS TRAFFIC CONTROL SECTION AT (858) 495-4742 TO OBTAIN A PERMIT. THE CONTRACTOR MUST SUBMIT A COMPLETED TRAFFIC CONTROL PERMIT FORM A MINIMUM OF TWO (2) WORKING DAYS PRIOR TO STARTING WORK, OR FIVE (5) WORKING DAYS WHEN THE WORK WILL AFFECT A TRAFFIC SIGNAL.
2. STANDARDS. THE TRAFFIC CONTROL PLAN SHALL CONFORM TO THE MOST RECENT ADOPTED EDITION OF EACH OF THE FOLLOWING MANUALS:

DOCUMENT NO.	EDITION	DESCRIPTION
PWPI070116-01	2018	STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (GREENBOOK)
PWPI070116-02	2018	CITY OF SAN DIEGO SUPPLEMENT TO THE "GREENBOOK" ("WHITEBOOK")
PWPI070116-03	2018	CITY OF SAN DIEGO STANDARD DRAWINGS
PWPI070116-07	2014	CALIFORNIA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (CA MUTCD) REVISIONS 1, 2, & 3)

3. NOTIFICATIONS. THE CONTRACTOR SHALL NOTIFY THE FOLLOWING AFFECTED AGENCIES A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO ANY EXCAVATION, CONSTRUCTION, OR TRAFFIC CONTROL:

• SAN DIEGO FIRE DEPARTMENT DISPATCH	STREET OR ALLEY CLOSURE	(858) 573-1300
• SAN DIEGO POLICE DEPARTMENT DISPATCH	STREET OR ALLEY CLOSURE	(858) 495-7800
• SAN DIEGO WASTE MANAGEMENT DEPT.	REFUSE COLLECTION	(858) 694-7000
• SAN DIEGO STREET DIVISION / ELECTRICAL	CITY OF SAN DIEGO TRAFFIC SIGNALS	(619) 527-7500 & (858) 495-4741
• SAN DIEGO TRANSIT	BUS STOPS	(619) 595-7038
• MTDB	TAXI ZONES	(619) 235-2643
• UNDERGROUND SERVICE ALERT	ANY EXCAVATION	(800) 422-4133 or 811
• LA MESA POLICE DEPARTMENT	STREET / ALLEY CLOSURE / DETOURS	(619) 667-1400
• HEARTLAND FIRE & RESCUE DISPATCH	STREET / ALLEY CLOSURE / DETOURS	(619) 441-1621
• HEARTLAND FIRE & RESCUE CHIEF SWANEY	ALL TRAFFIC CONTROL IMPACTS	(619) 441-1611
• LA MESA EDCO	REFUSE COLLECTION	(619) 287-7555
• SELECT ELECTRIC, INC.	LA MESA TRAFFIC SIGNALS	(619) 460-6060
• LA MESA ENGINEERING DIVISION	CIVIL & TRAFFIC ENGINEERING	(619) 667-1166

THE CONTRACTOR SHALL NOTIFY PROPERTY OWNERS AND TENANTS A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO CLOSURE OF DRIVEWAYS. THE CONTRACTOR SHALL POST SIGNS NOTIFYING THE PUBLIC A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO CLOSURE OF STREETS.

4. POSTING NO PARKING SIGNS. THE CONTRACTOR SHALL POST "TOW-AWAY/NO PARKING" SIGNS FORTY-EIGHT (48) HOURS IN ADVANCE FOR TEMPORARY PARKING REMOVAL. SIGNS SHALL INDICATE SPECIFIC DAYS, DATES AND TIMES OF RESTRICTIONS.
5. EXCAVATIONS. EXCEPT AS OTHERWISE SHOWN ON THE PLANS, TRENCHES SHALL BE BACKFILLED OR TRENCH-PLATED AT THE END OF EACH WORK DAY. AN ASPHALT RAMP SHALL BE PLACED AROUND EACH TRENCH PLATE TO PREVENT THE PLATE FROM BEING DISLODGED. CONTRACTOR SHALL MONITOR TRENCH PLATES DURING NON-WORKING HOURS TO ENSURE THAT THEY DO NOT BECOME DISLODGED. UPON COMPLETION OF EXCAVATION BACKFILL, THE CONTRACTOR SHALL PROVIDE A SATISFACTORY SURFACE FOR TRAFFIC. WHEN CONSTRUCTION OPERATIONS ARE NOT ACTIVELY IN PROGRESS, THE CONTRACTOR SHALL MAINTAIN ALL TRAVEL LANES, BIKE LANES AND PEDESTRIAN WALKWAYS OPEN TO APPROPRIATE TRAFFIC, EXCEPT AS OTHERWISE SHOWN ON THE PLANS.
6. RESTORATION OF TRAFFIC CONTROL DEVICES. THE CONTRACTOR SHALL REPAIR OR REPLACE TRAFFIC CONTROL DEVICES (INCLUDING TRAFFIC SIGNS, STRIPING, PAVEMENT MARKERS, PAVEMENT MARKINGS LEGENDS, CURB MARKINGS, LOOP DETECTORS, TRAFFIC SIGNAL EQUIPMENT, ETC.) DAMAGED OR REMOVED AS A RESULT OF OPERATIONS AND NOT DESIGNATED FOR REMOVAL. REPAIRS AND REPLACEMENTS SHALL BE EQUAL TO EXISTING IMPROVEMENTS.
7. TEMPORARY TRAFFIC SIGNAL DETECTION. THE CONTRACTOR SHALL INSTALL CITY APPROVED TEMPORARY VIDEO OR RADAR DETECTION WHEN EXISTING TRAFFIC SIGNAL DETECTION SYSTEMS ARE DAMAGED, DISABLED OR BECOME INEFFECTIVE DUE TO CONSTRUCTION FOR A PERIOD OF FIVE (5) OR MORE DAYS. THE CONTRACTOR SHALL COMPLETELY REMOVE ALL TEMPORARY TRAFFIC SIGNAL DETECTION EQUIPMENT AND RESTORE/INSTALL A CITY APPROVED PERMANENT VEHICLE DETECTION SYSTEM UPON COMPLETION OF CONSTRUCTION. ALL INSTALLATIONS AND REMOVALS ARE SUBJECT TO APPROVAL BY THE CITY ENGINEER.
8. CHANGES IN WORK. THE CITY RESIDENT ENGINEER WILL OBSERVE THESE TRAFFIC CONTROL PLANS IN OPERATION AND RESERVES THE RIGHT TO MAKE CHANGES AS THE FIELD CONDITIONS WARRANT. ANY SUCH CHANGES SHALL BE DOCUMENTED AND SUPERSEDE THESE PLANS.

CALTRANS NOTES (PERTAINS TO ALL SHEETS)

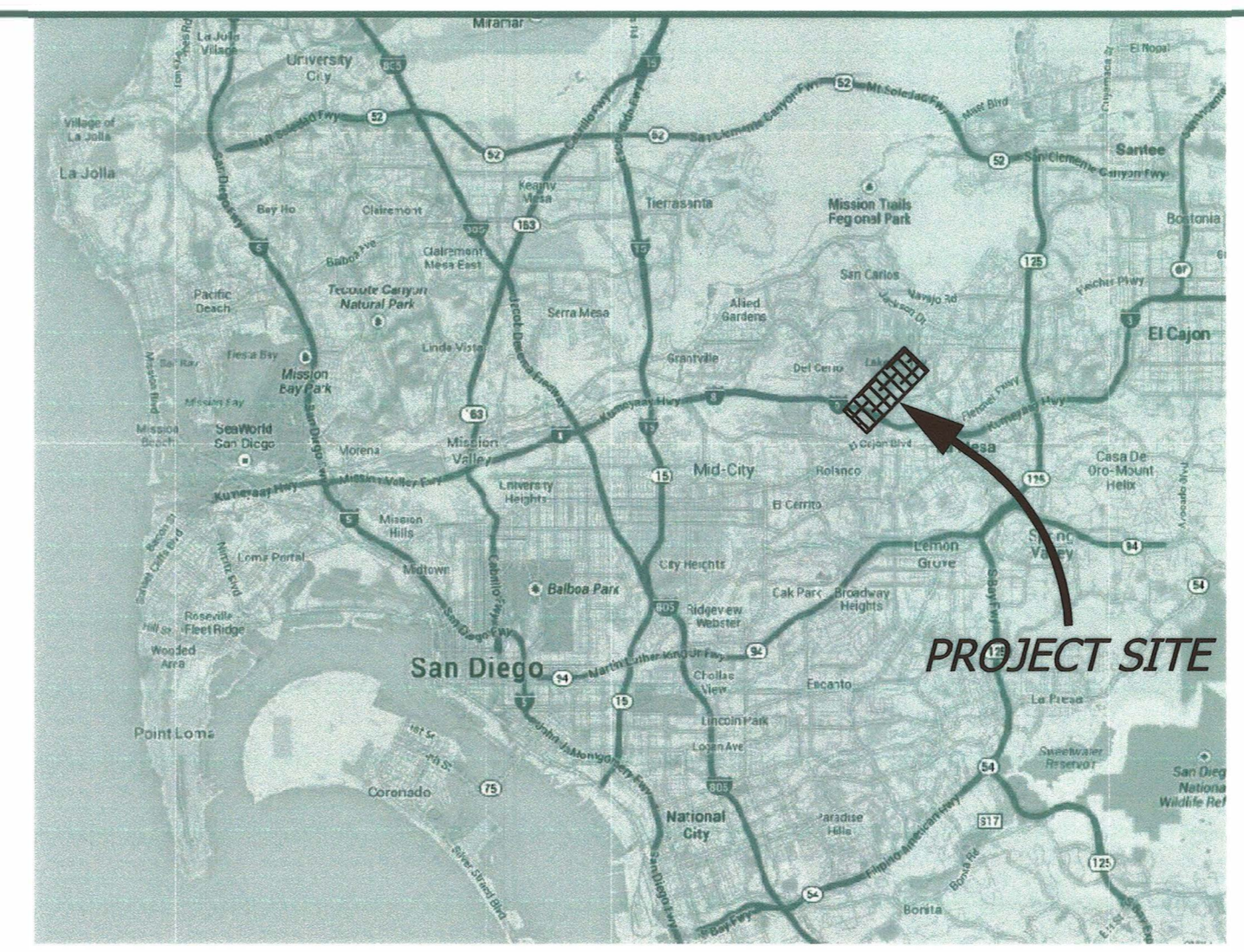
1. CONTRACTOR SHALL PLAN A PRE-CONSTRUCTION MEETING WITH CALTRANS SIGNAL OPERATIONS (SHERI BABAKI, 619-954-8570) PRIOR TO THE START OF THE PROJECT.
2. CONTACT CALTRANS SIGNAL OPERATIONS (SHERI BABAKI) AND ELECTRICAL MAINTENANCE (MARTIN ESCALANTE, 619-572-3410) FIVE DAYS PRIOR TO START OF WORK FOR EACH PHASE OF THE PROJECT.
3. AVOID PLACING METAL TRAFFIC BARRICADES ON LOOP DETECTORS.



EXAMPLE TRAFFIC SIGNAL MODIFICATION NOTE

TRAFFIC SIGNAL NOTE: CONTRACTOR SHALL COORDINATE WITH TRAFFIC CONTROL OR SIGNAL SECTION (XXX) XXX-XXXX A MINIMUM OF 5 (FIVE) WORKING DAYS PRIOR TO WORK AFFECTING A TRAFFIC SIGNAL IN THE CITY OF SAN DIEGO / LA MESA / CALTRANS. TRAFFIC SIGNAL TO BE PLACED ON "RED" FLASH.

(TO BE PLACED ON ALL SHEETS WITH WORK IN SIGNALIZED INTERSECTIONS)
 SEE TRAFFIC CONTROL NOTE 3 "NOTIFICATIONS" & CALTRANS NOTES 1 & 2 AT LEFT FOR CONTACT INFORMATION



VICINITY MAP



LOCATION MAP

PERMIT NUMBER: 11-16-NUN-0034
 CO: SD RTE: 8 PM: 9.56
 AS-BUILT PLANS FOR ROADWAY GEOMETRIC AND ABOVE GROUND FEATURES
 STATE REPRESENTATIVE: _____ DATE: _____

LEGEND

- - DELINEATOR/CONE
- ⊙ - TRAFFIC DRUM / BARREL
- ↔ - TRAFFIC DIRECTION
- ++++ - TYPE I BARRICADES
- +++ - TYPE III BARRICADES
- ⊕ - TYPE III BARRICADE WITH SIGN
- ▨ - TRENCH LINE
- ⚠ - HIGH LEVEL WARNING DEVICE SEE CALTRANS TRAFFIC MANUAL
- Ⓡ - TRAFFIC SIGN
- Ⓡ - DOUBLE TRAFFIC SIGN
- Ⓡ - FLASHING ARROW SIGN
- Ⓡ - CHANGEABLE MESSAGE SIGN
- ▬ - ABSORB 350 INLINE IMPACT ATTENUATOR SYSTEM
- ▬ - WATER FILLED BARRIER SYSTEM
- ⚠ - FLAGGER WITH C28 PADDLE
- ⚠ - WARNING LIGHTS (FLASHING/STEADY BURN)
- ××× - 6 FT CONSTRUCTION FENCING
- ▨ - TRANSITION AREA
- ▨ - CONCRETE MEDIAN
- ▨ - WORK ZONE
- Ⓡ - SIGNALIZED INTERSECTION

T-1

CITY OF LA MESA

APPROVED BY: _____ DATE: _____

PRINT NAME: _____

PLANS PREPARED UNDER THE SUPERVISION OF:

Bill E. Darnell 5/14/2019
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19

Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373

DATE: May 13, 2019 BY: DdB

TRAFFIC CONTROL PLANS FOR:

MONTEZUMA PPL / MID-CITY PIPELINE PH 2

NOTES SHEET, VICINITY MAP, AND LEGEND FOR TRAFFIC CONTROL PLAN SET (SHEETS T-1 THRU T-71)

CITY OF SAN DIEGO, CALIFORNIA
 PUBLIC WORKS DEPARTMENT
 SHEET 11 OF 171 SHEETS

WATER WBS: S-11026
 WBS: NONE

APPROVED FOR CITY ENGINEER: **Ahmed Aburamah** 5/31/2019
 DEPUTY CITY ENGINEER

DESIGNED BY: **MARYAM KARGAR**
 PROJECT MANAGER

DESIGNED BY: **JACOB RIVERA**
 PROJECT ENGINEER

DESCRIPTION BY APPROVED DATE FILMED

ORIGINAL D&A
 ADDENDUM E D&A 5/31/19

SEE SHEETS CC527 COORDINATE
 SEE SHEETS CC583 COORDINATE

CONTRACTOR INSPECTOR: _____ DATE STARTED: _____ DATE COMPLETED: _____

39739-T-1-D

CONSTRUCTION CHANGE / ADDENDUM			
CHANGE	DATE	AFFECTED OR ADDED SHEET NUMBERS	APPROVAL NO.
⚠	5/31/19	T-1 (37333-11-D), T-20 (37333-120-D), T-22 (37333-122-D), T-26 (37333-126-D), T-67 (37333-167-D), T-68 (37333-168-D), T-69 (37333-169-D), T-70 (37333-170-D)	

WARNING

0 1/2 1

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.



AS-BUILT INFORMATION

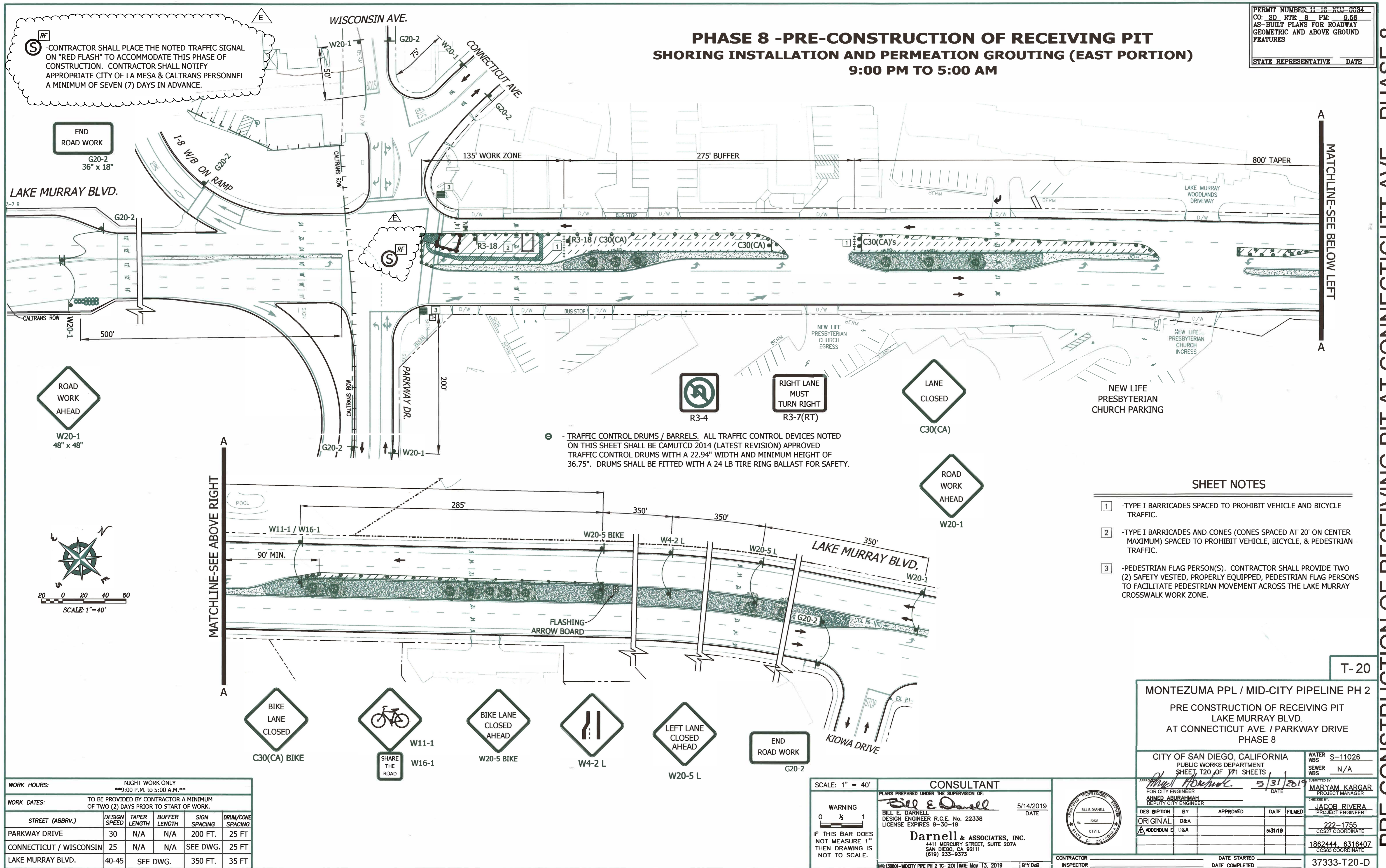
NO.	DESCRIPTION	DATE



PERMIT NUMBER 11-18-NW-0034
 CO: SD RTE: 8 PM: 9.58
 AS-BUILT PLANS FOR ROADWAY
 GEOMETRIC AND ABOVE GROUND
 FEATURES
 STATE REPRESENTATIVE DATE

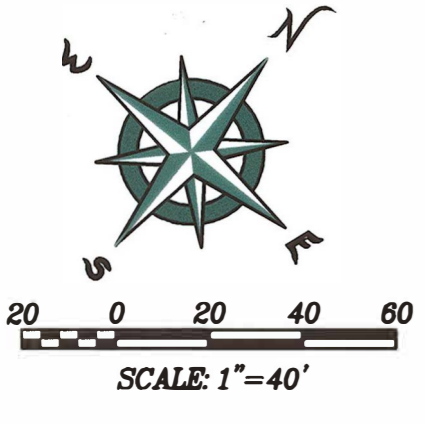
PHASE 8 - PRE-CONSTRUCTION OF RECEIVING PIT SHORING INSTALLATION AND PERMEATION GROUTING (EAST PORTION) 9:00 PM TO 5:00 AM

S - CONTRACTOR SHALL PLACE THE NOTED TRAFFIC SIGNAL ON "RED FLASH" TO ACCOMMODATE THIS PHASE OF CONSTRUCTION. CONTRACTOR SHALL NOTIFY APPROPRIATE CITY OF LA MESA & CALTRANS PERSONNEL A MINIMUM OF SEVEN (7) DAYS IN ADVANCE.



⊙ - TRAFFIC CONTROL DRUMS / BARRELS. ALL TRAFFIC CONTROL DEVICES NOTED ON THIS SHEET SHALL BE CAMUTCD 2014 (LATEST REVISION) APPROVED TRAFFIC CONTROL DRUMS WITH A 22.94" WIDTH AND MINIMUM HEIGHT OF 36.75". DRUMS SHALL BE FITTED WITH A 24 LB TIRE RING BALLAST FOR SAFETY.

- ### SHEET NOTES
- 1 - TYPE I BARRICADES SPACED TO PROHIBIT VEHICLE AND BICYCLE TRAFFIC.
 - 2 - TYPE I BARRICADES AND CONES (CONES SPACED AT 20' ON CENTER MAXIMUM) SPACED TO PROHIBIT VEHICLE, BICYCLE, & PEDESTRIAN TRAFFIC.
 - 3 - PEDESTRIAN FLAG PERSON(S). CONTRACTOR SHALL PROVIDE TWO (2) SAFETY VESTED, PROPERLY EQUIPPED, PEDESTRIAN FLAG PERSONS TO FACILITATE PEDESTRIAN MOVEMENT ACROSS THE LAKE MURRAY CROSSWALK WORK ZONE.



WORK HOURS: NIGHT WORK ONLY **9:00 P.M. to 5:00 A.M.**					
TO BE PROVIDED BY CONTRACTOR A MINIMUM OF TWO (2) DAYS PRIOR TO START OF WORK.					
STREET (ABBREV.)	DESIGN SPEED	TAPER LENGTH	BUFFER LENGTH	SIGN SPACING	DRUM/CONE SPACING
PARKWAY DRIVE	30	N/A	N/A	200 FT.	25 FT
CONNECTICUT / WISCONSIN	25	N/A	N/A	SEE DWG.	25 FT
LAKE MURRAY BLVD.	40-45	SEE DWG.	350 FT.	350 FT.	35 FT

SCALE: 1" = 40'

WARNING
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CONSULTANT

PLANS PREPARED UNDER THE SUPERVISION OF:
Bill E. Darnell
 BILL E. DARNELL
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19

5/14/2019
DATE

Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373

DATE STARTED: 5/13/2019
 DATE COMPLETED: BY DdB

T-20

**MONTEZUMA PPL / MID-CITY PIPELINE PH 2
 PRE CONSTRUCTION OF RECEIVING PIT
 LAKE MURRAY BLVD.
 AT CONNECTICUT AVE. / PARKWAY DRIVE
 PHASE 8**

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET T20 OF 171 SHEETS		WATER WBS S-11026 SEWER WBS N/A
APPROVED FOR CITY ENGINEER <i>Ahmed Aburahmah</i> AHMED ABURAHMAH DEPUTY CITY ENGINEER	DATE 5/31/2019	SUBMITTED BY MARYAM KARGAR PROJECT MANAGER
DES. OPTION BY APPROVED DATE FILMED	CHECKED BY JACOB RIVERA PROJECT ENGINEER	
ORIGINAL D&A	222-1755 CCS27 COORDINATE	
ADDENDUM E D&A	1862444_6316407 CCS83 COORDINATE	
CONTRACTOR INSPECTOR		37333-T20-D

PRE CONSTRUCTION OF RECEIVING PIT AT CONNECTICUT AVE. - PHASE 8

PHASE 10 - EXCAVATION OF RECEIVING PIT, TRENCHING, AND PIPE INSTALLATION

NIGHT TIME SETUP REQUIREMENTS
 ALL TRAFFIC CONTROL EQUIPMENT USED ON THIS PHASE OF CONSTRUCTION SHALL BE RETROREFLECTIVE AND SUITABLE FOR NIGHT TIME DRIVING OPERATIONS. ALL BARRICADES AND SIGNS SHALL BE OUTFITTED WITH TYPE "B" HIGH INTENSITY FLASHING WARNING LIGHTS EXCEPT WHERE NOTED ON THE PLAN AND ALL TRAFFIC CONTROL DRUMS / BARRELS AND CONES / DELINEATORS SHALL BE OUTFITTED WITH REFLECTIVE COLLARS.

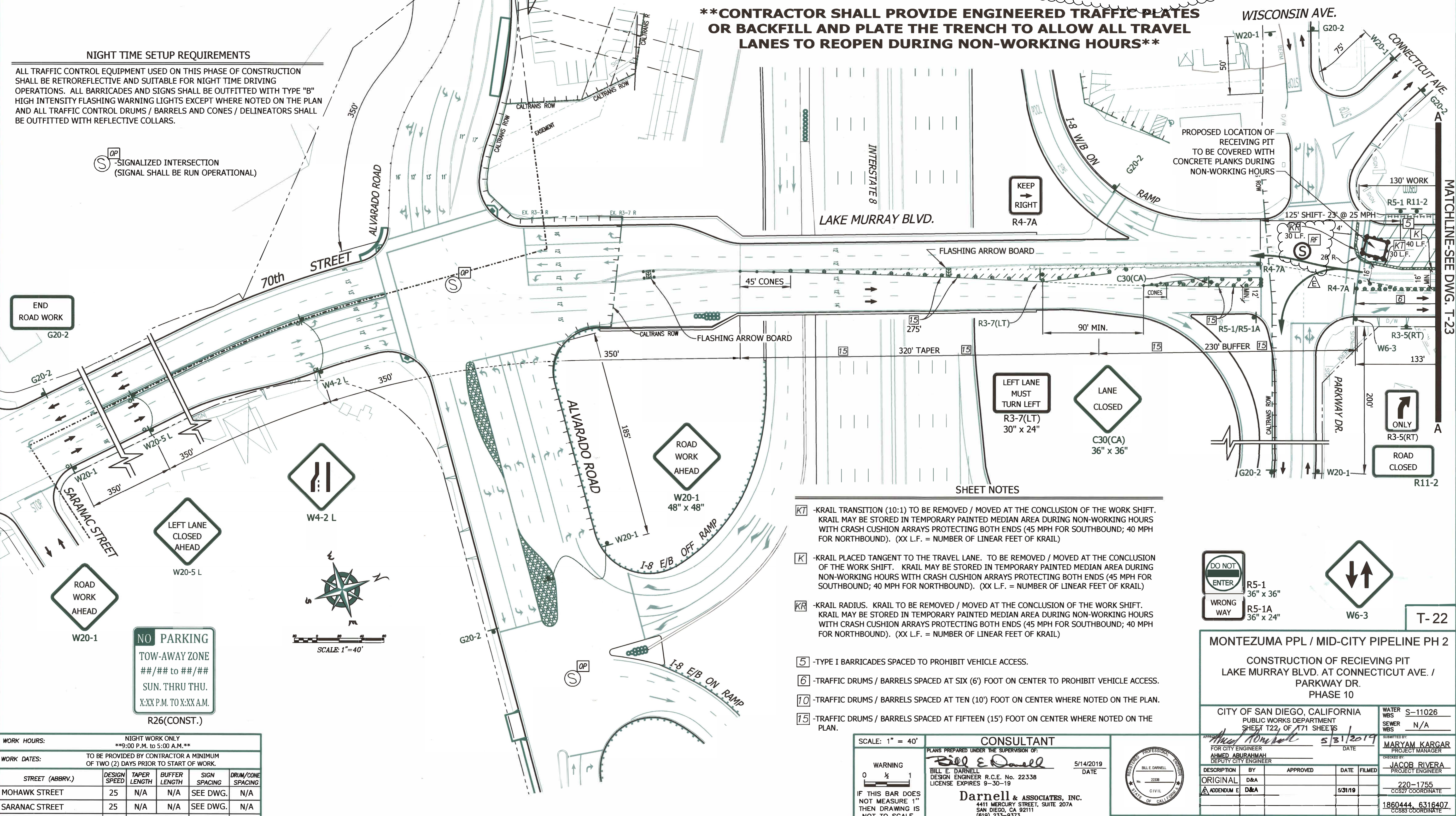
S - SIGNALIZED INTERSECTION (SIGNAL SHALL BE RUN OPERATIONAL)

⊖ - TRAFFIC CONTROL DRUMS / BARRELS. ALL TRAFFIC CONTROL DEVICES NOTED ON THIS SHEET SHALL BE CAMUTCD 2014 (LATEST REVISION) APPROVED TRAFFIC CONTROL DRUMS WITH A 22.94" WIDTH AND MINIMUM HEIGHT OF 36.75". DRUMS SHALL BE FITTED WITH A 24 LB TIRE RING BALLAST FOR SAFETY.

S SIGNALIZED INTERSECTION NOTE: THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE CITY OF LA MESA & CALTRANS TRAFFIC SIGNAL PERSONNEL A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE OF BEGINNING WORK ON THIS PHASE OF CONSTRUCTION. SIGNAL SHALL BE PLACED ON "RED FLASH".

PERMIT NUMBER: 11-16-NW-0034
 CO: SD RTE 8 PM: 9.56
 AS-BUILT PLANS FOR ROADWAY GEOMETRIC AND ABOVE GROUND FEATURES
 STATE REPRESENTATIVE _____ DATE _____

****CONTRACTOR SHALL PROVIDE ENGINEERED TRAFFIC PLATES OR BACKFILL AND PLATE THE TRENCH TO ALLOW ALL TRAVEL LANES TO REOPEN DURING NON-WORKING HOURS****

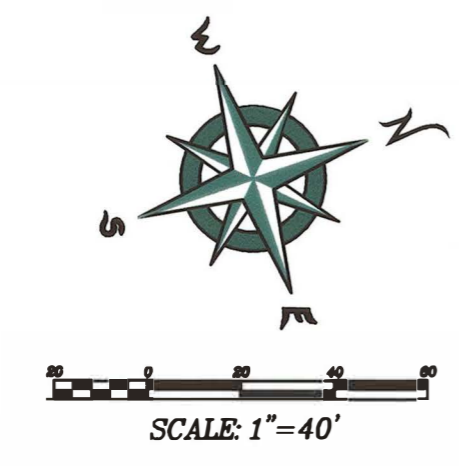


END ROAD WORK
G20-2

ROAD WORK AHEAD
W20-1

LEFT LANE CLOSED AHEAD
W20-5 L

NO PARKING TOW-AWAY ZONE
 ###/## to ##/##
 SUN. THRU THU.
 X:XX P.M. TO X:XX A.M.
 R26(CONST.)



LEFT LANE MUST TURN LEFT
R3-7(LT)
30" x 24"

LANE CLOSED
C30(CA)
36" x 36"

- SHEET NOTES**
- KT** -KRAIL TRANSITION (10:1) TO BE REMOVED / MOVED AT THE CONCLUSION OF THE WORK SHIFT. KRAIL MAY BE STORED IN TEMPORARY PAINTED MEDIAN AREA DURING NON-WORKING HOURS WITH CRASH CUSHION ARRAYS PROTECTING BOTH ENDS (45 MPH FOR SOUTHBOUND; 40 MPH FOR NORTHBOUND). (XX L.F. = NUMBER OF LINEAR FEET OF KRAIL)
 - K** -KRAIL PLACED TANGENT TO THE TRAVEL LANE. TO BE REMOVED / MOVED AT THE CONCLUSION OF THE WORK SHIFT. KRAIL MAY BE STORED IN TEMPORARY PAINTED MEDIAN AREA DURING NON-WORKING HOURS WITH CRASH CUSHION ARRAYS PROTECTING BOTH ENDS (45 MPH FOR SOUTHBOUND; 40 MPH FOR NORTHBOUND). (XX L.F. = NUMBER OF LINEAR FEET OF KRAIL)
 - KR** -KRAIL RADIUS. KRAIL TO BE REMOVED / MOVED AT THE CONCLUSION OF THE WORK SHIFT. KRAIL MAY BE STORED IN TEMPORARY PAINTED MEDIAN AREA DURING NON-WORKING HOURS WITH CRASH CUSHION ARRAYS PROTECTING BOTH ENDS (45 MPH FOR SOUTHBOUND; 40 MPH FOR NORTHBOUND). (XX L.F. = NUMBER OF LINEAR FEET OF KRAIL)
 - 5** -TYPE I BARRICADES SPACED TO PROHIBIT VEHICLE ACCESS.
 - 6** -TRAFFIC DRUMS / BARRELS SPACED AT SIX (6) FOOT ON CENTER TO PROHIBIT VEHICLE ACCESS.
 - 10** -TRAFFIC DRUMS / BARRELS SPACED AT TEN (10) FOOT ON CENTER WHERE NOTED ON THE PLAN.
 - 15** -TRAFFIC DRUMS / BARRELS SPACED AT FIFTEEN (15) FOOT ON CENTER WHERE NOTED ON THE PLAN.

DO NOT ENTER
WRONG WAY

R5-1
36" x 36"

R5-1A
36" x 24"

W6-3

T-22

MONTEZUMA PPL / MID-CITY PIPELINE PH 2
 CONSTRUCTION OF RECEIVING PIT
 LAKE MURRAY BLVD. AT CONNECTICUT AVE. /
 PARKWAY DR.
 PHASE 10

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET T22 OF 171 SHEETS		WATER WBS S-11026 SEWER WBS N/A	
APPROVED: <i>Bill E. Darnell</i> 5/31/2019 FOR CITY ENGINEER AHMED ABURAHMAH DEPUTY CITY ENGINEER		SUBMITTED BY: MARYAM KARGAR PROJECT MANAGER	
DESCRIPTION	BY	APPROVED	DATE
ORIGINAL	D&A		5/31/19
ADDENDUM E	D&A		5/31/19
1860444_6316407 CC883 COORDINATE		220-1755 CC827 COORDINATE	
CONTRACTOR		DATE STARTED	
INSPECTOR		DATE COMPLETED	
		37333-T22-D	

SCALE: 1" = 40'

WARNING
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CONSULTANT
 PLANS PREPARED UNDER THE SUPERVISION OF:
Bill E. Darnell
 BILL E. DARNELL
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19
Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373

DATE: 5/14/2019

CONTRACTOR: BY: DoB

WORK HOURS: NIGHT WORK ONLY
 9:00 P.M. TO 5:00 A.M.

WORK DATES: TO BE PROVIDED BY CONTRACTOR A MINIMUM OF TWO (2) DAYS PRIOR TO START OF WORK.

STREET (ABBRV.)	DESIGN SPEED	TAPER LENGTH	BUFFER LENGTH	SIGN SPACING	DRUM/CONE SPACING
MOHAWK STREET	25	N/A	N/A	SEE DWG.	N/A
SARANAC STREET	25	N/A	N/A	SEE DWG.	N/A
LAKE MURRAY BLVD.	40	SEE DWG.	350 FT.	350 FT.	35 FT

CONSTRUCTION OF RECEIVING PIT - LAKE MURRAY AT CONNECTICUT - PHASE 10

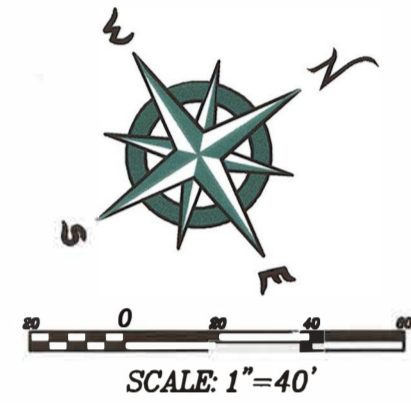
PHASE 12

NIGHT TIME SETUP REQUIREMENTS

ALL TRAFFIC CONTROL EQUIPMENT USED ON THIS PHASE OF CONSTRUCTION SHALL BE RETROREFLECTIVE AND SUITABLE FOR NIGHT TIME DRIVING OPERATIONS. ALL BARRICADES AND SIGNS SHALL BE OUTFITTED WITH TYPE "B" HIGH INTENSITY FLASHING WARNING LIGHTS EXCEPT WHERE NOTED ON THE PLAN AND ALL TRAFFIC CONTROL DRUMS / BARRELS AND CONES / DELINEATORS SHALL BE OUTFITTED WITH REFLECTIVE COLLARS.

⊖ - TRAFFIC CONTROL DRUMS / BARRELS. ALL TRAFFIC CONTROL DEVICES NOTED ON THIS SHEET SHALL BE CAMUTCD 2014 (LATEST REVISION) APPROVED TRAFFIC CONTROL DRUMS WITH A 22.94" WIDTH AND MINIMUM HEIGHT OF 36.75". DRUMS SHALL BE FITTED WITH A 24 LB TIRE RING BALLAST FOR SAFETY.

Ⓢ^{OP} - SIGNALIZED INTERSECTION (RUN SIGNAL OPERATIONAL)

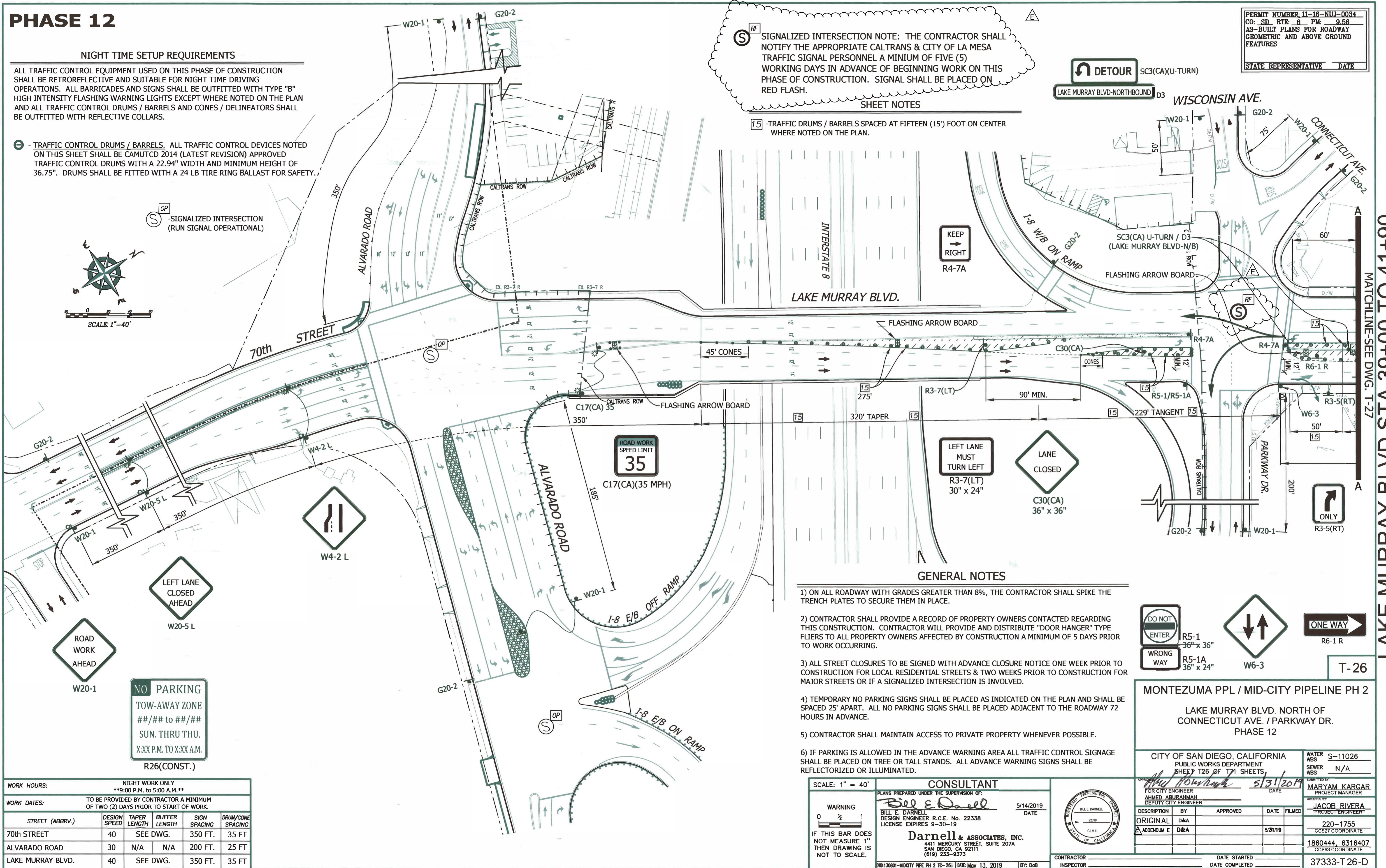


SIGNALIZED INTERSECTION NOTE: THE CONTRACTOR SHALL NOTIFY THE APPROPRIATE CALTRANS & CITY OF LA MESA TRAFFIC SIGNAL PERSONNEL A MINIMUM OF FIVE (5) WORKING DAYS IN ADVANCE OF BEGINNING WORK ON THIS PHASE OF CONSTRUCTION. SIGNAL SHALL BE PLACED ON RED FLASH.

SHEET NOTES

15 - TRAFFIC DRUMS / BARRELS SPACED AT FIFTEEN (15') FOOT ON CENTER WHERE NOTED ON THE PLAN.

PERMIT NUMBER: 11-18-NUI-0034
 CO: SD RTE: 8 PM: 9.58
 AS-BUILT PLANS FOR ROADWAY GEOMETRIC AND ABOVE GROUND FEATURES
 STATE REPRESENTATIVE: _____ DATE: _____



GENERAL NOTES

- 1) ON ALL ROADWAY WITH GRADES GREATER THAN 8%, THE CONTRACTOR SHALL SPIKE THE TRENCH PLATES TO SECURE THEM IN PLACE.
- 2) CONTRACTOR SHALL PROVIDE A RECORD OF PROPERTY OWNERS CONTACTED REGARDING THIS CONSTRUCTION. CONTRACTOR WILL PROVIDE AND DISTRIBUTE "DOOR HANGER" TYPE FLIERS TO ALL PROPERTY OWNERS AFFECTED BY CONSTRUCTION A MINIMUM OF 5 DAYS PRIOR TO WORK OCCURRING.
- 3) ALL STREET CLOSURES TO BE SIGNED WITH ADVANCE CLOSURE NOTICE ONE WEEK PRIOR TO CONSTRUCTION FOR LOCAL RESIDENTIAL STREETS & TWO WEEKS PRIOR TO CONSTRUCTION FOR MAJOR STREETS OR IF A SIGNALIZED INTERSECTION IS INVOLVED.
- 4) TEMPORARY NO PARKING SIGNS SHALL BE PLACED AS INDICATED ON THE PLAN AND SHALL BE SPACED 25' APART. ALL NO PARKING SIGNS SHALL BE PLACED ADJACENT TO THE ROADWAY 72 HOURS IN ADVANCE.
- 5) CONTRACTOR SHALL MAINTAIN ACCESS TO PRIVATE PROPERTY WHENEVER POSSIBLE.
- 6) IF PARKING IS ALLOWED IN THE ADVANCE WARNING AREA ALL TRAFFIC CONTROL SIGNAGE SHALL BE PLACED ON TREE OR TALL STANDS. ALL ADVANCE WARNING SIGNS SHALL BE REFLECTORIZED OR ILLUMINATED.



MONTEZUMA PPL / MID-CITY PIPELINE PH 2
 LAKE MURRAY BLVD. NORTH OF CONNECTICUT AVE. / PARKWAY DR.
 PHASE 12

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET T26 OF T71 SHEETS		WATER WBS S-11026 SEWER WBS N/A
APPROVED BY: <i>Maryam Kargar</i> 5/31/2019 FOR CITY ENGINEER	DATE	DESIGNED BY: MARYAM KARGAR PROJECT MANAGER
APPROVED BY: <i>Jacob Rivera</i> DEPUTY CITY ENGINEER	DATE	CHECKED BY: JACOB RIVERA PROJECT ENGINEER
DESCRIPTION	BY	APPROVED
ORIGINAL	D&A	DATE
APPENDUM E	D&A	5/31/19
1860444, 6316407 CCS27 COORDINATE		220-1755 CCS83 COORDINATE
DATE STARTED		37333-T26-D
DATE COMPLETED		

WORK HOURS: NIGHT WORK ONLY **9:00 P.M. TO 5:00 A.M.**					
WORK DATES: TO BE PROVIDED BY CONTRACTOR A MINIMUM OF TWO (2) DAYS PRIOR TO START OF WORK.					
STREET (ABBRV.)	DESIGN SPEED	TAPER LENGTH	BUFFER LENGTH	SIGN SPACING	DRUM/CONE SPACING
70th STREET	40	SEE DWG.	350 FT.	35 FT	35 FT
ALVARADO ROAD	30	N/A	N/A	200 FT.	25 FT
LAKE MURRAY BLVD.	40	SEE DWG.	350 FT.	35 FT	35 FT

SCALE: 1" = 40'

WARNING

IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CONSULTANT
 PLANS PREPARED UNDER THE SUPERVISION OF:
Bill E. Darnell 5/14/2019
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19
Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373

CONTRACTOR INSPECTOR

\\SERVER1\Public\Server Recovered Data\Projects\130801 - MID CITY PIPELINE\CAD\130801-Mid City Pipeline Caltrans Resubmit May 2019\130801-T26 thru T27-Lake Murray no Connecticut-12.dwg
 13-May-19 12:54
 June 7, 2019
 Montezuma PPL/Mid-City Pipeline PH2 and 70th-Alvarado to Saranac Sidewalk
 Page 12 of 16

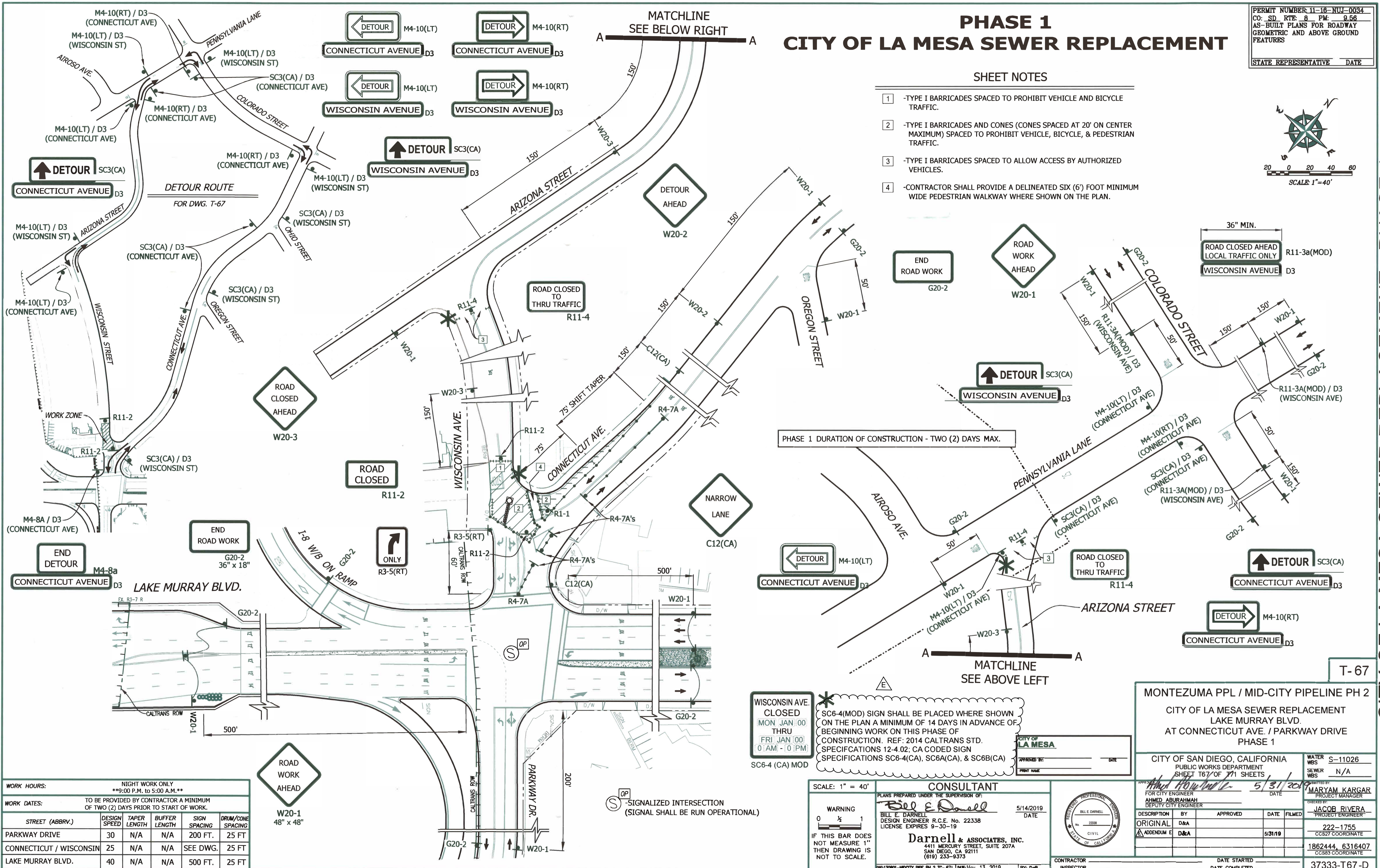
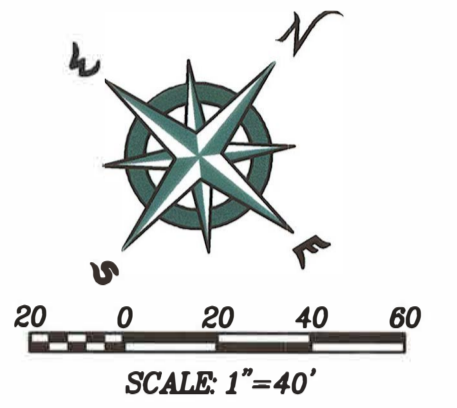
LAKE MURRAY BLVD STA 06+14 TO 00+36 STA 36+14
 MATCHLINE-SEE DWG. T-27

PHASE 1 CITY OF LA MESA SEWER REPLACEMENT

PERMIT NUMBER 11-16-NUI-0034
 CO: SD RTE: 8 PM: 9.56
 AS-BUILT PLANS FOR ROADWAY
 GEOMETRIC AND ABOVE GROUND
 FEATURES
 STATE REPRESENTATIVE DATE

SHEET NOTES

- 1 -TYPE I BARRICADES SPACED TO PROHIBIT VEHICLE AND BICYCLE TRAFFIC.
- 2 -TYPE I BARRICADES AND CONES (CONES SPACED AT 20' ON CENTER MAXIMUM) SPACED TO PROHIBIT VEHICLE, BICYCLE, & PEDESTRIAN TRAFFIC.
- 3 -TYPE I BARRICADES SPACED TO ALLOW ACCESS BY AUTHORIZED VEHICLES.
- 4 -CONTRACTOR SHALL PROVIDE A DELINEATED SIX (6') FOOT MINIMUM WIDE PEDESTRIAN WALKWAY WHERE SHOWN ON THE PLAN.



PHASE 1 DURATION OF CONSTRUCTION - TWO (2) DAYS MAX.

WISCONSIN AVE.
 CLOSED
 MON JAN 00
 THRU
 FRI JAN 00
 0:AM - 10:PM
 SC6-4 (CA) MOD

* SC6-4(MOD) SIGN SHALL BE PLACED WHERE SHOWN ON THE PLAN A MINIMUM OF 14 DAYS IN ADVANCE OF BEGINNING WORK ON THIS PHASE OF CONSTRUCTION. REF: 2014 CALTRANS STD. SPECIFICATIONS 12-4.02; CA CODED SIGN (SPECIFICATIONS SC6-4(CA), SC6A(CA), & SC6B(CA))

CITY OF LA MESA
 APPROVED BY: _____ DATE: _____
 PRINT NAME: _____

WORK HOURS: NIGHT WORK ONLY
 9:00 P.M. to 5:00 A.M.

WORK DATES: TO BE PROVIDED BY CONTRACTOR A MINIMUM OF TWO (2) DAYS PRIOR TO START OF WORK.

STREET (ABBRV.)	DESIGN SPEED	TAPER LENGTH	BUFFER LENGTH	SIGN SPACING	DRUM/ CONE SPACING
PARKWAY DRIVE	30	N/A	N/A	200 FT.	25 FT
CONNECTICUT / WISCONSIN	25	N/A	N/A	SEE DWG.	25 FT
LAKE MURRAY BLVD.	40	N/A	N/A	500 FT.	25 FT

ROAD WORK AHEAD
 W20-1
 48" x 48"

SCALE: 1" = 40'

WARNING
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CONSULTANT
 PLANS PREPARED UNDER THE SUPERVISION OF:
 Bill E. Darnell
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19
 Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373

DATE: 5/14/2019
 BY: DoB

CITY OF LA MESA
 APPROVED BY: _____ DATE: _____
 PRINT NAME: _____

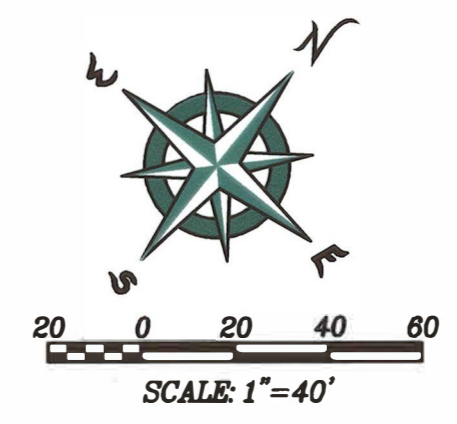
MONTEZUMA PPL / MID-CITY PIPELINE PH 2
 CITY OF LA MESA SEWER REPLACEMENT
 LAKE MURRAY BLVD.
 AT CONNECTICUT AVE / PARKWAY DRIVE
 PHASE 1

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET 167 OF 171 SHEETS		WATER WBS S-11026 SEWER WBS N/A
APPROVED BY: <i>Ahmed Aburahmah</i> FOR CITY ENGINEER	DATE: 5/31/2019	APPROVED BY: <i>Maryam Kargar</i> PROJECT MANAGER
APPROVED BY: _____ DEPUTY CITY ENGINEER	DATE: _____	APPROVED BY: <i>Jacob Rivera</i> PROJECT ENGINEER
DESCRIPTION BY APPROVED DATE FILMED	222-1755 CCS27 COORDINATE	
ORIGINAL D&A	1862444, 6316407 CCS83 COORDINATE	
ADDENDUM E D&A	37333-T67-D	
DATE STARTED _____ DATE COMPLETED _____		
CONTRACTOR	INSPECTOR	

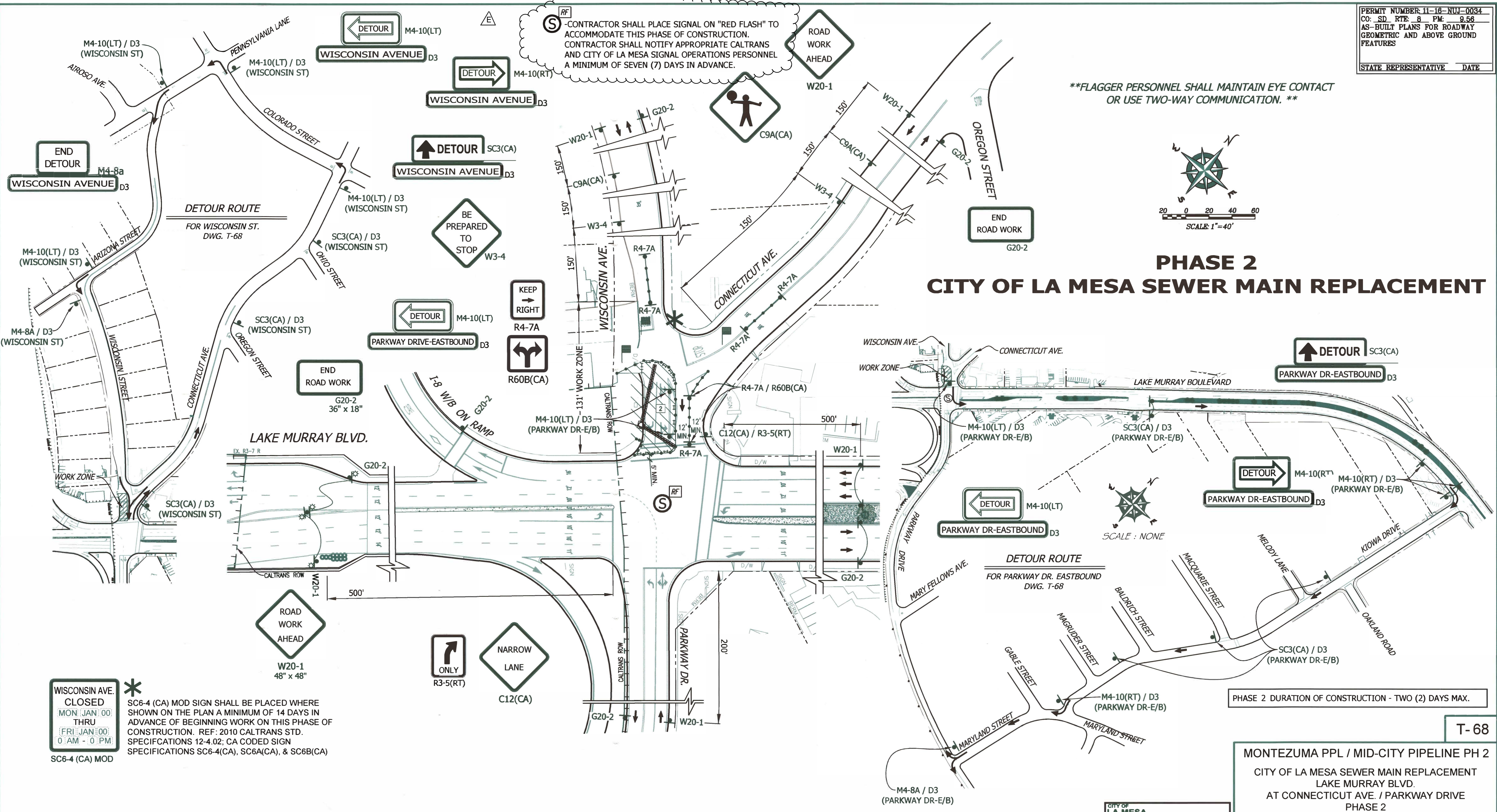
CITY OF LA MESA SEWER REPLACEMENT - PHASE 1

PERMIT NUMBER 11-16-NUJ-0084
 CO. SD RTE. 8 PM. 9.58
 AS-BUILT PLANS FOR ROADWAY
 GEOMETRIC AND ABOVE GROUND
 FEATURES
 STATE REPRESENTATIVE DATE

**FLAGGER PERSONNEL SHALL MAINTAIN EYE CONTACT
 OR USE TWO-WAY COMMUNICATION. **



PHASE 2 CITY OF LA MESA SEWER MAIN REPLACEMENT



WISCONSIN AVE. CLOSED
 MON: JAN 00
 THRU
 FRI: JAN 00
 0 AM - 0 PM
 SC6-4 (CA) MOD

* SC6-4 (CA) MOD SIGN SHALL BE PLACED WHERE SHOWN ON THE PLAN A MINIMUM OF 14 DAYS IN ADVANCE OF BEGINNING WORK ON THIS PHASE OF CONSTRUCTION. REF: 2010 CALTRANS STD. SPECIFICATIONS 12-4.02; CA CODED SIGN SPECIFICATIONS SC6-4(CA), SC6A(CA), & SC6B(CA)

ROAD WORK AHEAD
 W20-1
 48" x 48"

NARROW LANE
 C12(CA)

SHEET NOTES

- TYPE I BARRICADES SPACED TO PROHIBIT VEHICLE AND BICYCLE TRAFFIC.
- TYPE I BARRICADES AND CONES (CONES SPACED AT 20' ON CENTER MAXIMUM) SPACED TO PROHIBIT VEHICLE, BICYCLE, & PEDESTRIAN TRAFFIC.
- TYPE I BARRICADES SPACED TO ALLOW ACCESS BY AUTHORIZED VEHICLES.

WORK HOURS: NIGHT WORK ONLY **9:00 P.M. to 5:00 A.M.**					
WORK DATES: TO BE PROVIDED BY CONTRACTOR A MINIMUM OF TWO (2) DAYS PRIOR TO START OF WORK.					
STREET (ABBRV.)	DESIGN SPEED	TAPER LENGTH	BUFFER LENGTH	SIGN SPACING	DRUM/CONE SPACING
PARKWAY DRIVE	30	N/A	N/A	200 FT.	25 FT
CONNECTICUT / WISCONSIN	25	SEE DWG.	SEE DWG.	25 FT	
LAKE MURRAY BLVD.	40	N/A	N/A	500 FT.	25 FT

PHASE 2 DURATION OF CONSTRUCTION - TWO (2) DAYS MAX.

T-68

MONTEZUMA PPL / MID-CITY PIPELINE PH 2
 CITY OF LA MESA SEWER MAIN REPLACEMENT
 LAKE MURRAY BLVD.
 AT CONNECTICUT AVE. / PARKWAY DRIVE
 PHASE 2

CITY OF LA MESA		CITY OF SAN DIEGO, CALIFORNIA		WATER WBS S-11026	
APPROVED BY: _____		PUBLIC WORKS DEPARTMENT		SEWER WBS N/A	
DATE: _____		SHEET 168 OF 171 SHEETS		SUBMITTED BY: MARYAM KARGAR	
PROJECT NAME: _____		DATE: 5/31/2019		PROJECT MANAGER: MARYAM KARGAR	
FOR CITY ENGINEER: AHMED ABURAHMAH		DATE: 5/31/19		CHECKED BY: JACOB RIVERA	
DEPUTY CITY ENGINEER		DATE: 5/31/19		PROJECT ENGINEER	
DESCRIPTION BY APPROVED DATE FILMED		222-1755		CCS27 COORDINATE	
ORIGINAL D&A		1862444_6316407		CCS83 COORDINATE	
ADDENDUM E D&A		DATE STARTED		37333-T68-D	
CONTRACTOR INSPECTOR		DATE COMPLETED			

SCALE: 1" = 40'

WARNING
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CONSULTANT
 PLANS PREPARED UNDER THE SUPERVISION OF:
 Bill E. Darnell
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19
 Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373
 DATE: 5/14/2019

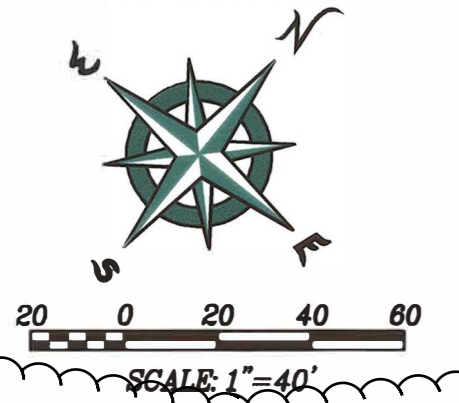
CITY OF LA MESA
 APPROVED BY: _____
 DATE: _____
 PROJECT NAME: _____

CONTRACTOR INSPECTOR: _____
 DATE STARTED: _____
 DATE COMPLETED: _____

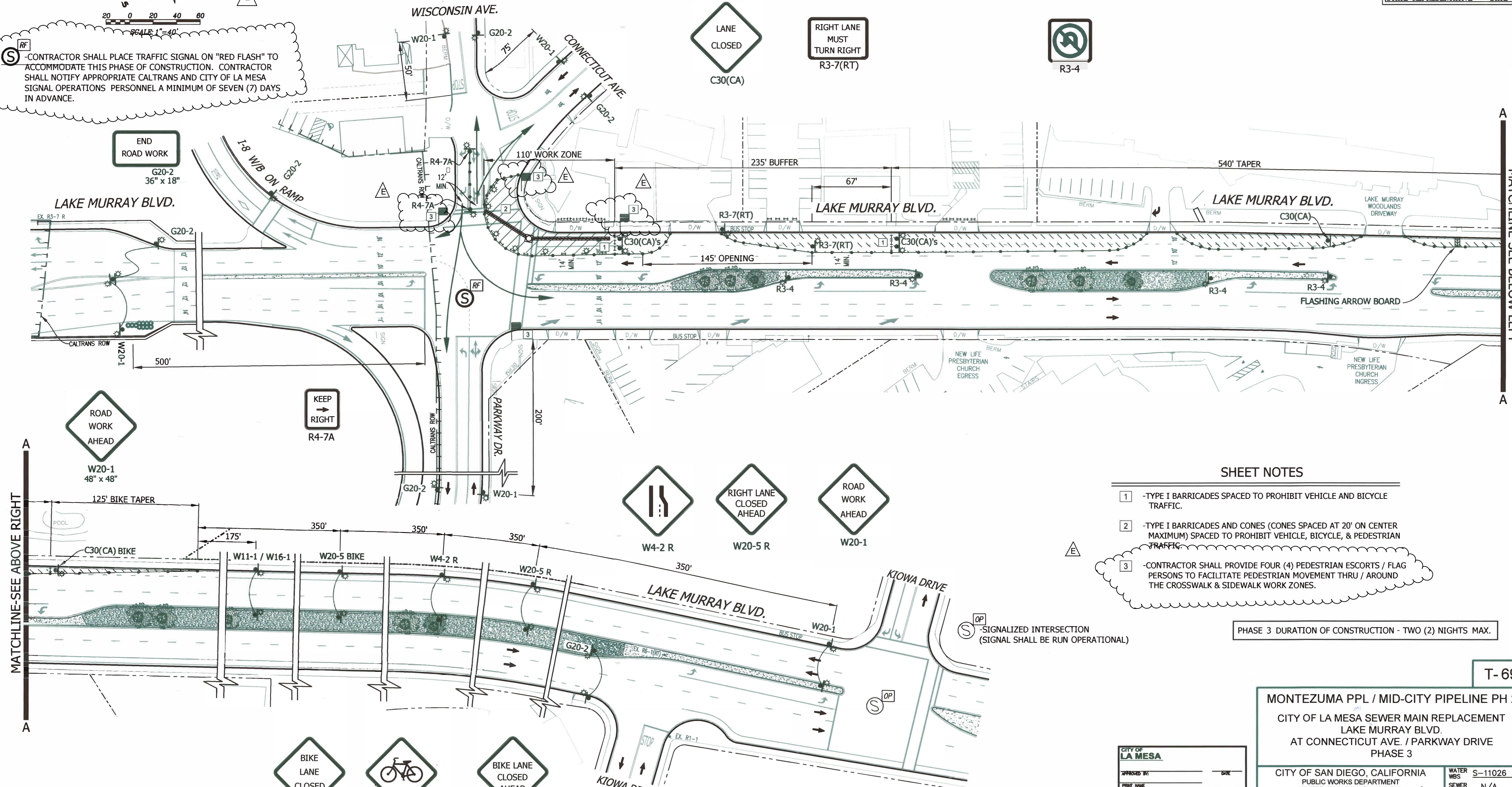
CITY OF LA MESA SEWER MAIN REPLACEMENT - PHASE 2

PHASE 3 CITY OF LA MESA SEWER MAIN REPLACEMENT

PERMIT NUMBER: 11-18-NW-0034
 CO. SD. RTE. 8 PM. 9.56
 AS-BUILT PLANS FOR ROADWAY
 GEOMETRIC AND ABOVE GROUND
 FEATURES
 STATE REPRESENTATIVE _____ DATE _____



S - CONTRACTOR SHALL PLACE TRAFFIC SIGNAL ON "RED FLASH" TO ACCOMMODATE THIS PHASE OF CONSTRUCTION. CONTRACTOR SHALL NOTIFY APPROPRIATE CALTRANS AND CITY OF LA MESA SIGNAL OPERATIONS PERSONNEL A MINIMUM OF SEVEN (7) DAYS IN ADVANCE.



- ### SHEET NOTES
- 1 -TYPE I BARRICADES SPACED TO PROHIBIT VEHICLE AND BICYCLE TRAFFIC.
 - 2 -TYPE I BARRICADES AND CONES (CONES SPACED AT 20' ON CENTER MAXIMUM) SPACED TO PROHIBIT VEHICLE, BICYCLE, & PEDESTRIAN TRAFFIC.
 - 3 -CONTRACTOR SHALL PROVIDE FOUR (4) PEDESTRIAN ESCORTS / FLAG PERSONS TO FACILITATE PEDESTRIAN MOVEMENT THRU / AROUND THE CROSSWALK & SIDEWALK WORK ZONES.

PHASE 3 DURATION OF CONSTRUCTION - TWO (2) NIGHTS MAX.

WORK HOURS: NIGHT WORK ONLY
 9:00 P.M. to 5:00 A.M.

WORK DATES: TO BE PROVIDED BY CONTRACTOR A MINIMUM OF TWO (2) DAYS PRIOR TO START OF WORK.

STREET (ABBRV.)	DESIGN SPEED	TAPER LENGTH	BUFFER LENGTH	SIGN SPACING	DRUM/CONE SPACING
PARKWAY DRIVE	30	N/A	N/A	200 FT.	25 FT
CONNECTICUT / WISCONSIN	25	N/A	N/A	SEE DWG.	25 FT
LAKE MURRAY BLVD.	45	SEE DWG.	500 FT.	500 FT.	35 FT



END ROAD WORK
 G20-2

SCALE: 1" = 40'

WARNING
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CONSULTANT
 PLANS PREPARED UNDER THE SUPERVISION OF:
Bill E. Darnell
 BILL E. DARNELL
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19
Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373

DATE: 5/14/2019

CONTRACTOR INSPECTOR: _____

CITY OF LA MESA
 APPROVED BY: _____ DATE: _____
 PRINT NAME: _____

T-69

MONTEZUMA PPL / MID-CITY PIPELINE PH 2
 CITY OF LA MESA SEWER MAIN REPLACEMENT
 LAKE MURRAY BLVD.
 AT CONNECTICUT AVE. / PARKWAY DRIVE
 PHASE 3

CITY OF SAN DIEGO, CALIFORNIA
 PUBLIC WORKS DEPARTMENT
 SHEET 169 OF 771 SHEETS

APPROVED: *Maryam Kargar* 5/31/2019
 FOR CITY ENGINEER
 AHMED ABURAHMAN
 DEPUTY CITY ENGINEER

DATE: 5/31/2019

CONTRACTOR: _____
 INSPECTOR: _____

DATE STARTED: _____
 DATE COMPLETED: _____

WATER WBS: S-11026
 SEWER WBS: N/A

SUBMITTED BY: MARYAM KARGAR
 PROJECT MANAGER

CHECKED BY: JACOB RIVERA
 PROJECT ENGINEER

DESCRIPTION: ORIGINAL D&A
 BY: D&A
 APPROVED: _____
 DATE: 5/31/19
 FILMED: _____

222-1755
 CCS27 COORDINATE

1862444, 6316407
 CCS83 COORDINATE

37333-T69-D

\\SERVER1\Public\Server Recovered Data\Projects\130801 - MID CITY PIPELINE\CAD\130801-Mid City Pipeline Caltrans Resubmit May 2019\130801-T68 thru T71-La Mesa Sewer-2-4.dwg
 13-May-19 12:14 Dove Bermudez

MATCHLINE-SEE BELOW LEFT

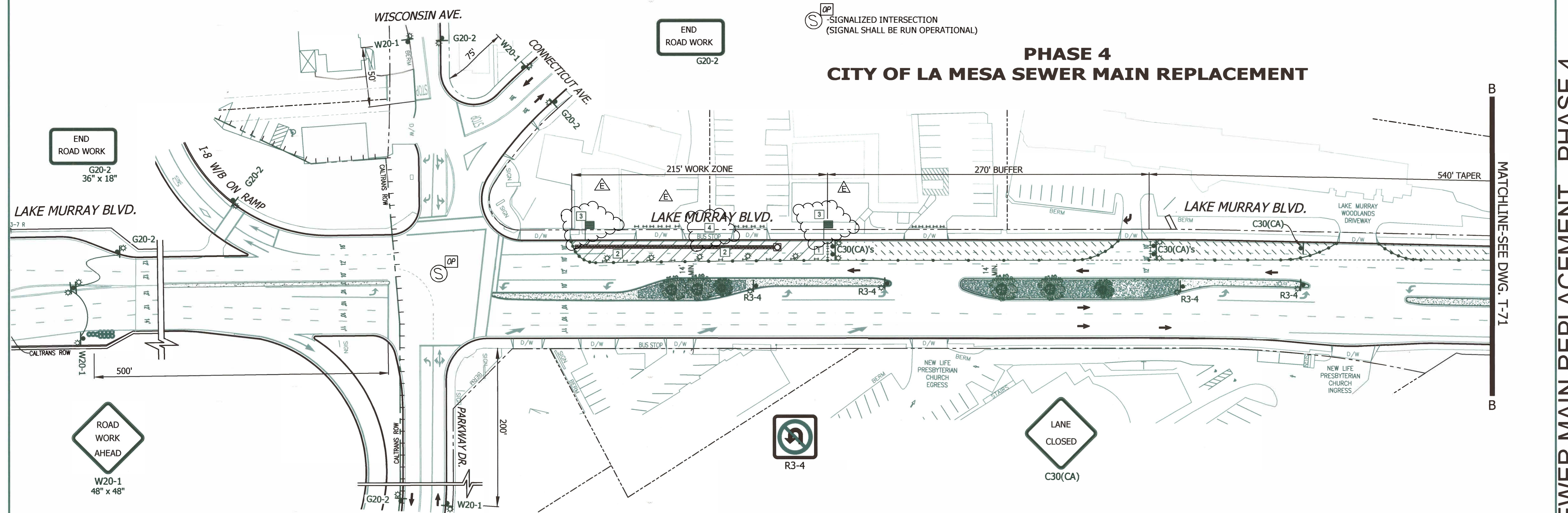
MATCHLINE-SEE ABOVE RIGHT

CITY OF LA MESA SEWER MAIN REPLACEMENT - PHASE 3

PERMIT NUMBER 11-16-NUL-0034
 CO: SD RTE: 8 PM: 9.56
 AS-BUILT PLANS FOR ROADWAY
 GEOMETRIC AND ABOVE GROUND
 FEATURES
 STATE REPRESENTATIVE DATE

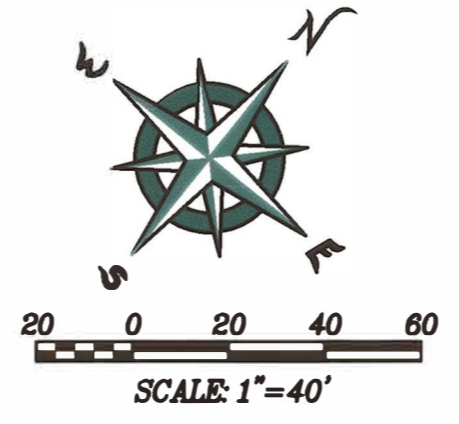
OP
 SIGNALIZED INTERSECTION
 (SIGNAL SHALL BE RUN OPERATIONAL)

**PHASE 4
 CITY OF LA MESA SEWER MAIN REPLACEMENT**



SHEET NOTES

- 1 -TYPE I BARRICADES SPACED TO PROHIBIT VEHICLE AND BICYCLE TRAFFIC.
- 2 -TYPE I BARRICADES AND CONES (CONES SPACED AT 20' ON CENTER MAXIMUM) SPACED TO PROHIBIT VEHICLE, BICYCLE, & PEDESTRIAN TRAFFIC.
- 3 -CONTRACTOR SHALL PROVIDE TWO (2) PEDESTRIAN ESCORTS / FLAG PERSONS TO FACILITATE PEDESTRIAN MOVEMENT THRU / AROUND THE SIDEWALK & WORK ZONES.
- 4 -BUS STOP CLOSURE. CONTRACTOR SHALL NOTIFY SAN DIEGO TRANSIT A MINIMUM OF ONE (1) WEEK PRIOR TO STARTING WORK ON THIS PHASE OF CONSTRUCTION. CONTRACTOR SHALL NOTIFY SAN DIEGO TRANSIT AT (619) 238-0100 EXT. 424



PHASE 4 DURATION OF CONSTRUCTION - TWO (2) NIGHTS MAX.

T-70

MONTEZUMA PPL / MID-CITY PIPELINE PH 2
 CITY OF LA MESA SEWER MAIN REPLACEMENT
 LAKE MURRAY BLVD.
 AT CONNECTICUT AVE. / PARKWAY DRIVE
 PHASE 4

CITY OF LA MESA
 APPROVED BY: _____ DATE: _____
 PRINT NAME

CITY OF SAN DIEGO, CALIFORNIA PUBLIC WORKS DEPARTMENT SHEET T70 OF T71 SHEETS		WATER WBS S-11026 SEWER WBS N/A
APPROVED BY: <i>Maryam Kargar</i> FOR CITY ENGINEER AHMED ABURAHMAH DEPUTY CITY ENGINEER	DATE: 5/31/2019	SUBMITTED BY: MARYAM KARGAR PROJECT MANAGER CHECKED BY: JACOB RIVERA PROJECT ENGINEER
DESCRIPTION	BY	APPROVED
ORIGINAL	D&A	DATE: 5/31/19
ADDENDUM E	D&A	DATE: 5/31/19
1862444, 6316407 CCS83 COORDINATE		37333-T70-D

SCALE: 1" = 40'

WARNING
 0 1/2 1
 IF THIS BAR DOES NOT MEASURE 1" THEN DRAWING IS NOT TO SCALE.

CONSULTANT
 PLANS PREPARED UNDER THE SUPERVISION OF:
Bill E. Darnell
 BILL E. DARNELL
 DESIGN ENGINEER R.C.E. No. 22338
 LICENSE EXPIRES 9-30-19
 DATE: 5/14/2019
 Darnell & ASSOCIATES, INC.
 4411 MERCURY STREET, SUITE 207A
 SAN DIEGO, CA 92111
 (619) 233-9373



WORK HOURS: NIGHT WORK ONLY
 9:00 P.M. to 5:00 A.M.

WORK DATES: TO BE PROVIDED BY CONTRACTOR A MINIMUM OF TWO (2) DAYS PRIOR TO START OF WORK.

STREET (ABBRV.)	DESIGN SPEED	TAPER LENGTH	BUFFER LENGTH	SIGN SPACING	DRUM/CONE SPACING
PARKWAY DRIVE	30	N/A	N/A	200 FT.	25 FT
CONNECTICUT / WISCONSIN	25	N/A	N/A	SEE DWG.	25 FT
LAKE MURRAY BLVD.	40-45	SEE DWG.	350 FT.	350 FT.	35 FT

CITY OF LA MESA SEWER MAIN REPLACEMENT - PHASE 4

Bid Results

Bidder Details

Vendor Name James W. Fowler Co.
Address 12775 Westview Drive
 Dallas, OR 97338
 United States

Respondee John B. Fowler
Respondee Title President
Phone 503-623-5373 Ext.
Email johnf@jwfowler.com

Vendor Type PQUAL
License # 777391
CADIR

Bid Detail

Bid Format Electronic
Submitted June 19, 2019 1:55:34 PM (Pacific)
Delivery Method
Bid Responsive
Bid Status Submitted
Confirmation # 178515
Ranking 0

Respondee Comment

Buyer Comment

Attachments

File Title	File Name	File Type
Contractor's Certification of Pending Actions	Contractor's Certification of Pending Actions.pdf	Contractor's Certification of Pending Actions
Mandatory Disclosure of Business Interests	Mandatory Disclosure of Business Interests Form.pdf	Mandatory Disclosure of Business Interests Form
Subcontractor Listing	Subcontractors Listing Forms- JWF.pdf	Subcontractor Listing (Other Than First Tier)
Bid Bond	Bid Bond.pdf	Bid Bond

Line Items

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
Main Bid Montezuma PPL/Mid-City Pipeline Ph2						
1	Bonds (Payment and Performance)					
	524126	LS	1	\$185,000.00	\$185,000.00	
2	Field Orders (EOC Type II)					
		AL	1	\$3,542,000.00	\$3,542,000.00	
3	Mobilization					
	237110	LS	1	\$1,000,000.00	\$1,000,000.00	
4	Specialty Inspection Paid For By the Contractor					
	237110	LS	1	\$170,000.00	\$170,000.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
5	Specialty Testing Under the Direction of the Engineer (EOC Type I)					
	237110	AL	1	\$95,000.00	\$95,000.00	
6	Archaeological and Native American Monitoring Program					
	541690	LF	1000	\$11.00	\$11,000.00	
7	Paleontological Monitoring Program					
	541690	LF	4900	\$8.00	\$39,200.00	
8	Archaeological and Native American Mitigation and Curation (EOC Type I)					
	541690	AL	1	\$5,000.00	\$5,000.00	
9	Paleontological Mitigation and Excavation					
	541690	CY	100	\$185.00	\$18,500.00	
10	Suspension of Work - Resources					
	541690	DAYS	15	\$15,500.00	\$232,500.00	
11	Denny's Security Guard					
	S	AL	1	\$84,000.00	\$84,000.00	
12	Caltrans Encroachment Permit Submittal (EOC Type I)					
	237310	AL	1	\$30,000.00	\$30,000.00	
13	MTS Right of Entry Permit (EOC Type I)					
	237110	AL	1	\$15,000.00	\$15,000.00	
14	Miscellaneous Agency Fees (EOC Type I)					
	237310	AL	1	\$90,000.00	\$90,000.00	
15	Drinking Water Discharge Monitoring by QSP					
	237110	LS	1	\$7,400.00	\$7,400.00	
16	Sewage Bypass and Pumping Plan (Diversion Plan)					
	237110	LS	1	\$1,600.00	\$1,600.00	
17	SWPPP Development					
	541330	LS	1	\$30,000.00	\$30,000.00	
18	SWPPP Implementation					
	237110	LS	1	\$190,000.00	\$190,000.00	
19	SWPPP Permit Fee (EOC Type I)					
	541330	AL	1	\$1,500.00	\$1,500.00	
20	Dewatering Permit and Discharge Fees (EOC Type I)					
	237110	AL	1	\$1,500.00	\$1,500.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
21	Dewatering Non-Hazardous Contaminated Water					
	237110	LS	1	\$135,000.00	\$135,000.00	
22	Video Recording of Existing Conditions					
	238990	LS	1	\$10,000.00	\$10,000.00	
23	Exclusive Community Liaison Services					
	541820	LS	1	\$60,000.00	\$60,000.00	
24	Preparation of Hazardous Waste Management Plan and Reporting					
	238990	LS	1	\$8,000.00	\$8,000.00	
25	Monitoring of Contaminated Soil					
	541690	LS	1	\$5,300.00	\$5,300.00	
26	Testing, Sampling, Site Storage, and Handling of Petroleum Contaminated Soil					
	238990	TON	1	\$1,100.00	\$1,100.00	
27	Loading, Transportation, and Disposal of Petroleum Contaminated Soil					
	238990	TON	1	\$1,700.00	\$1,700.00	
28	Clearing and Grubbing					
	238910	LS	1	\$38,000.00	\$38,000.00	
29	Tree Removal and Disposal (24-Inch Trunk Diameter and Greater)					
	238910	EA	2	\$4,500.00	\$9,000.00	
30	Excavate and Export (Unclassified)					
	237310	CY	12000	\$48.00	\$576,000.00	
31	Adjust Existing Gate Valve Frame and Cover to Grade					
	237310	EA	18	\$700.00	\$12,600.00	
32	Adjust Existing Manhole Frame and Cover to Grade					
	237310	EA	9	\$2,800.00	\$25,200.00	
33	Adjust Existing Survey Monument to Grade					
	237310	EA	2	\$4,900.00	\$9,800.00	
34	Traffic Signal Loop and Appurtenance Replacement (Type E)					
	237310	EA	18	\$800.00	\$14,400.00	
35	Cold Mill AC Pavement (> 1½ Inch - 3 Inch)					
	237310	SF	264666	\$0.50	\$132,333.00	
36	Asphalt Pavement Repair					
	237310	TON	180	\$280.00	\$50,400.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
37	Miscellaneous Asphalt Patching					
	237310	TON	100	\$440.00	\$44,000.00	
38	Subgrade Imported Backfill					
	237310	TON	570	\$14.00	\$7,980.00	
39	Pavement Restoration Adjacent to Trench					
	237310	SF	4500	\$9.00	\$40,500.00	
40	Asphalt Concrete Overlay					
	237310	TON	3088	\$130.00	\$401,440.00	
41	Concrete Pavement Replacement (8 Inch thick)					
	238910	CY	23	\$420.00	\$9,660.00	
42	Pavement Fabric					
	237310	SY	29407	\$2.60	\$76,458.20	
43	Asphalt Concrete ½ Inch Leveling Course					
	237310	TON	700	\$190.00	\$133,000.00	
44	Crack Seal					
	237310	LB	500	\$8.00	\$4,000.00	
45	Median Curb Inlet (Type J)					
	237110	EA	1	\$8,000.00	\$8,000.00	
46	Manholes (5ft x 3ft)					
	237110	EA	3	\$9,000.00	\$27,000.00	
47	Historical and Contractor Date Stamps and Impressions					
	237310	EA	13	\$530.00	\$6,890.00	
48	Remove and Replace Existing Sidewalk					
	237310	SF	200	\$18.00	\$3,600.00	
49	Additional Curb and Gutter Removal and Replacement					
	237310	LF	275	\$270.00	\$74,250.00	
50	Curb and Gutter (6 Inch Curb, Type G)					
	237310	LF	150	\$65.00	\$9,750.00	
51	Median Curb and Gutter (Type B3)					
	237310	LF	261	\$65.00	\$16,965.00	
52	Cross Gutter					
	237310	SF	1500	\$40.00	\$60,000.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
53	Curb Ramp (Type A) with Stainless Steel Detectable Warning Tiles					
	237310	EA	4	\$8,000.00	\$32,000.00	
54	Curb Ramp Modified (Type A, Per Sheet 45) with Stainless Steel Detectable Warning Tiles					
	237310	EA	1	\$9,400.00	\$9,400.00	
55	Curb Ramp (Type C1) with Stainless Steel Detectable Warning Tiles					
	237310	EA	10	\$8,700.00	\$87,000.00	
56	Curb Ramp (Type C2) with Stainless Steel Detectable Warning Tiles					
	237310	EA	1	\$9,200.00	\$9,200.00	
57	Curb Ramp Modified (Type D, Per Sheet 48) with Stainless Steel Detectable Warning Tiles					
	237310	EA	7	\$7,200.00	\$50,400.00	
58	Colored Stamped Concrete Raised Median					
	237310	SF	100	\$55.00	\$5,500.00	
59	Asphalt Concrete Raised Median					
	237310	SF	800	\$13.00	\$10,400.00	
60	Removal or Abandonment of Existing Water Facilities					
	237110	LF	800	\$26.00	\$20,800.00	
61	Abandon and Fill Existing Water Main Outside of the Trench Limit					
	237110	LF	2500	\$51.00	\$127,500.00	
62	Additional Bedding					
	237110	CY	720	\$33.00	\$23,760.00	
63	Water Main (66 Inch, Welded Steel) (Excluding Trenchless Crossings)					
	237110	LF	4140	\$1,930.00	\$7,990,200.00	
64	Water Main (8 Inch, Class C900 PVC)					
	237110	LF	422	\$210.00	\$88,620.00	
65	Engineered Trench Shoring					
	237110	LS	1	\$332,000.00	\$332,000.00	
66	Butterfly Valve (66 Inch, Class 200, Triple Offset)					
	237110	EA	3	\$325,000.00	\$975,000.00	
67	Butterfly Valve Vault					
	237110	EA	2	\$209,000.00	\$418,000.00	
68	Gate Valve (8 Inch)					
	237110	EA	3	\$3,700.00	\$11,100.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
69	Water Valve Bypass for Straight Mainline 16 Inch and Larger					
	237110	EA	3	\$23,800.00	\$71,400.00	
70	Fire Hydrant Assembly and Marker (6 Inch)					
	237110	EA	1	\$17,500.00	\$17,500.00	
71	Fire Service Connection (6 Inch)					
	237110	EA	2	\$9,000.00	\$18,000.00	
72	Meter Assembly					
	237110	EA	3	\$10,500.00	\$31,500.00	
73	Temporary Resurfacing					
	237310	TON	565	\$125.00	\$70,625.00	
74	Insertion Flow Meter					
	237110	EA	1	\$93,000.00	\$93,000.00	
75	Water Service (1 Inch)					
	237110	EA	3	\$4,600.00	\$13,800.00	
76	Water Service Transfer (1 Inch)					
	237110	EA	5	\$3,500.00	\$17,500.00	
77	Blow-Off Valve Assembly (2 Inch)					
	237110	EA	1	\$9,200.00	\$9,200.00	
78	Blow-Off Valve Assembly (6 Inch)					
	237110	EA	4	\$8,500.00	\$34,000.00	
79	Air and Vacuum (Air Release) Valve Assembly (6 Inch, Class 150)					
	237110	EA	8	\$13,300.00	\$106,400.00	
80	Sewer Lateral and Cleanout					
	237110	EA	6	\$4,500.00	\$27,000.00	
81	Imported Trench Backfill					
	237110	TON	4000	\$40.00	\$160,000.00	
82	TUNNEL: 108" SDCWA Pipeline Crossing, Sta. 45+42 to 45+69					
	237110	LF	27	\$45,000.00	\$1,215,000.00	
83	TUNNEL: Interstate 8 Pipeline Crossing					
	237110	LF	716	\$14,210.00	\$10,174,360.00	
84	Paint Striping					
	237310	LS	1	\$158,500.00	\$158,500.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
85	Traffic Control					
	237310	LS	1	\$612,500.00	\$612,500.00	
86	SDG&E Service Orders					
	238210	LS	1	\$25,000.00	\$25,000.00	
87	SDG&E Fee Allowance (EOC Type I)					
	238210	AL	1	\$5,000.00	\$5,000.00	
88	Remove and Reinstall Existing Light Pole					
	238210	EA	2	\$10,500.00	\$21,000.00	
89	Traffic Signal Modification					
	238210	EA	6	\$53,000.00	\$318,000.00	
90	Curb Ramp Barricade					
	237310	EA	2	\$530.00	\$1,060.00	
91	Electrical Work					
	238210	LS	1	\$207,000.00	\$207,000.00	
92	Fiber Optic Conduit					
	238210	LS	1	\$410,000.00	\$410,000.00	
93	Landscape work					
	561730	LS	1	\$45,000.00	\$45,000.00	
94	Irrigation System					
	561730	LS	1	\$35,000.00	\$35,000.00	
95	25-Month Revegetation Maintenance and Monitoring Program					
	541330	LS	1	\$25,000.00	\$25,000.00	
96	Contractor Furnished Materials for City Forces Connection, Cut and Plug, and Cut-in Work for Mains 16-Inch and Larger.					
	237110	EA	2	\$500.00	\$1,000.00	
97	High-lining Installation by the Contractor					
	237110	LF	1817	\$17.00	\$30,889.00	
98	High-lining Removed by the Contractor					
	237110	LF	1817	\$6.00	\$10,902.00	
99	Connections to the Existing System by Contractor (8 Inch through 12 Inch)					
	237110	EA	5	\$7,000.00	\$35,000.00	
100	Connections to the Existing System by Contractor (66 Inch)					
	237110	EA	1	\$36,000.00	\$36,000.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
101	Cathodic Protection System					
	237110	LS	1	\$220,000.00	\$220,000.00	
102	Hyperbaric Intervention (EOC Type I)					
	237990	AL	1	\$100,000.00	\$100,000.00	
103	Pavement Restoration for Final Connection					
	237110	SF	500	\$21.00	\$10,500.00	
104	Helix Water District Waterline Improvements					
	237110	LS	1	\$578,000.00	\$578,000.00	
105	Concrete Raised Median					
	237310	SF	1700	\$18.00	\$30,600.00	
106	Tree Removal (24-Inch Trunk Diameter and Greater) - Lake Murray Blvd					
	238910	EA	5	\$2,400.00	\$12,000.00	
107	New City of La Mesa Gateway Sign					
	238210	LS	1	\$26,400.00	\$26,400.00	
108	Remove and Reinstall Existing Light Pole					
	238210	EA	2	\$13,000.00	\$26,000.00	
109	Landscaping Work - Lake Murray Blvd					
	561730	LS	1	\$33,000.00	\$33,000.00	
110	Irrigation System - Lake Murray Blvd					
	561730	LS	1	\$46,000.00	\$46,000.00	
111	Testing, Sampling, Site Storage, Handling, Transportation, and Disposal of Non-RCRA Hazardous Waste Contamination from the Treatment of Contaminated Ground Water					
	238990	GAL	500	\$100.00	\$50,000.00	
112	Connection to Existing Valve Vault No. 3					
	237110	EA	1	\$103,000.00	\$103,000.00	
				Subtotal	\$33,224,042.20	
	Main Bid 70TH-Alvarado to Saranac-Sidewalk					
113	Bonds (Payment and Performance)					
	524126	LS	1	\$15,000.00	\$15,000.00	
114	Mobilization					
	237310	LS	1	\$25,000.00	\$25,000.00	
115	Field Orders (EOC Type II)					
		AL	1	\$15,000.00	\$15,000.00	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
116	Clearing and Grubbing					
	238910	LS	1	\$31,300.00	\$31,300.00	
117	Gravity Retaining Wall					
	238110	SF	235	\$95.00	\$22,325.00	
118	Curb and Gutter (8 Inch Curb, Type G)					
	237310	LF	600	\$55.00	\$33,000.00	
119	Curb Ramp (Type C1) with Detectable Warning Tiles					
	237310	EA	2	\$8,000.00	\$16,000.00	
120	Additional Sidewalk					
	237310	SF	3000	\$25.00	\$75,000.00	
121	Chain Link Fence (Black Vinyl Coated, H=4')					
	238990	LF	140	\$50.00	\$7,000.00	
122	Remove Existing Pedestrian Push Button					
	238210	EA	2	\$500.00	\$1,000.00	
123	Bidirectional Pedestrian Push Button					
	238210	EA	1	\$5,000.00	\$5,000.00	
124	Pedestrian Barricade					
	237310	EA	1	\$1,500.00	\$1,500.00	
125	Paint Striping					
	237310	LS	1	\$5,000.00	\$5,000.00	
126	WPCP Development					
	541330	LS	1	\$1,500.00	\$1,500.00	
127	WPCP Implementation					
	237310	LS	1	\$25,000.00	\$25,000.00	
				Subtotal	\$278,625.00	
	Additive Alternate Items A					
128	8-Inch Sewer Main (La Mesa)					
	237110	LF	373	\$270.00	\$100,710.00	
129	Manholes (5ft x 3ft) (La Mesa)					
	237110	EA	4	\$9,000.00	\$36,000.00	
				Subtotal	\$136,710.00	
	Deductive Alternate Items B					
130	Cold Mill AC Pavement (2 Inch) (La Mesa)					
	237310	SF	99900	(\$0.50)	(\$49,950.00)	

Bid Results

Type	Item Code	UOM	Qty	Unit Price	Line Total	Comment
131	Asphalt Concrete Overlay (2 Inch) (La Mesa)					
	237310	TON	1020	(\$120.00)	(\$122,400.00)	
132	Adjust Existing Manhole Frame and Cover to Grade (La Mesa)					
	237310	EA	6	(\$2,000.00)	(\$12,000.00)	
133	Adjust existing Gate Valve Frame and Cover to Grade (La Mesa)					
	237310	EA	2	(\$1,150.00)	(\$2,300.00)	
134	Adjust Existing Survey Monument to Grade (La Mesa)					
	237310	EA	1	(\$4,500.00)	(\$4,500.00)	
135	Striping (70th St and Lake Murray Blvd - La Mesa)					
	237310	LS	1	(\$5,000.00)	(\$5,000.00)	
Subtotal					(\$196,150.00)	
Total					\$33,443,227.20	

Subcontractors

Name & Address	Description	License Num	CADIR	Amount	Type
Statewide Stripes, Inc. PO BOX 600710 San Diego, CA 92160 United States	Traffic Striping SLBE	788286	1000001334	\$53,899.00	
Alvarez And Shaw, Inc 13080 Hwy 8 Business el cajon, CA 92021 United States	Concrete - Flatwork ELBE	986171	1000052129	\$361,828.00	LAT,MALE,ELBE,DB E,MBE,CADIR,SDB
Western Gardens Landscaping, Inc. 4616 Pannonia Rd. Carlsbad, CA 92008 United States	Landscaping ELBE	662550	1000004289	\$174,366.00	CADIR,ELBE
Statewide Traffic Safety & Signs Inc 13755 Blaisdell Place Poway, CA 92064 United States	Traffic Control	975518	1000001109	\$579,000.00	CADIR
All American Asphalt PO Box 2229 Corona, CA 92878 United States	Asphalt Paving	267073	1000001051	\$947,030.00	CAU,MALE,CADIR
Southern Contracting Company 559 North Twin Oaks Valley Road San Marcos, CA 92069 United States	Electrical & Instrumentation	222252	1000002172	\$442,150.00	PQUAL,CADIR
Douglas Matheson & Co PO Box 4567 Oceanside, CA 92052 United States	Community Liason ELBE	000000	000000000	\$57,285.00	NAT,MALE,DBE,MB E
Red Tail Research and Monitoring, Inc. 328 State Place Escondido, CA 92029 United States	Archeo - Paleo Monitoring ELBE	000000	1000031633	\$47,410.00	NAT,MALE,DBE,MB E
K-Company 9554 Frank Way Santee, CA 92071 United States	Onsite Trucking ELBE	707834	1000031995	\$265,000.00	CAU,ELBE,MALE

Bid Results

Name & Address	Description	License Num	CADIR	Amount	Type
Condon Johnson 9685 Via Excelencia Suite 106 San Diego, CA 92126 United States	Permeation Grouting	300068	1000004443	\$1,406,000.00	
Dean's Certified Welding Inc. 27645 commerce center dr temecula, CA 92590 United States	Welding	618842	1000024764	\$223,000.00	
Cityscape Services 1241 Prospect Street La Jolla, CA 92037 United States	SWPPP ELBE	058686	1000060691	\$87,200.00	HUBZ
HMS Construction, Inc 2885 Scott Street Vista, CA 92081 United States	Traffic Signals	765590	1000000923	\$700,000.00	
Kissinger Trucking PO Box 261805 San Diego, CA 92196 United States	Export Trucking SLBE	000001	1000026115	\$740,000.00	
Bonita Pipeline, Inc. 140 N Glover Avenue Chula Vista, CA 91910 United States	Water & Sewer Improvements SLBE	817325	1000018819	\$5,800,000.00	LAT,MALE,SLBE,DVB E,DBE,HUBZ,MBE,C ADIR,SDVSB,SDB
Blue Iron Inc 3545 Carlin Dr West Sacramento, CA 95691 United States	Shafts	1009464	1000004297	\$862,500.00	

Line Totals (Unit Price * Quantity)								
Item Num	Section	Item Code	Description	Reference	Unit of Measure	Quantity	James W. Fowler Co. - Unit Price	James W. Fowler Co. - Line Total
1	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	524126	Bonds (Payment and Performance)	1-7.2.1	LS	1	\$185,000.00	\$185,000.00
2	Main Bid Montezuma PPL/Mid-City Pipeline Ph2		Field Orders (EOC Type II)	7-3.9	AL	1	\$3,542,000.00	\$3,542,000.00
3	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Mobilization	7-3.4.1	LS	1	\$1,000,000.00	\$1,000,000.00
4	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Specialty Inspection Paid For By the Contractor	4-3.4.1	LS	1	\$170,000.00	\$170,000.00

5	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Specialty Testing Under the Direction of the Engineer (EOC Type I)	4-3.4.1	AL	1	\$95,000.00	\$95,000.00
6	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541690	Archaeological and Native American Monitoring Program	6-6.2.1.1	LF	1000	\$11.00	\$11,000.00
7	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541690	Paleontological Monitoring Program	6-6.2.2.1	LF	4900	\$8.00	\$39,200.00
8	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541690	Archaeological and Native American Mitigation and Curation (EOC Type I)	6-6.2.3.1	AL	1	\$5,000.00	\$5,000.00
9	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541690	Paleontological Mitigation and Excavation	6-6.2.4.1	CY	100	\$185.00	\$18,500.00

10	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541690	Suspension of Work - Resources	6-6.2.1.1 OR 6- 6.2.2.1	DAYS	15	\$15,500.00	\$232,500.00
11	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	S	Denny's Security Guard	7-3.1	AL	1	\$84,000.00	\$84,000.00
12	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Caltrans Encroachment Permit Submittal (EOC Type I)	2-2.3	AL	1	\$30,000.00	\$30,000.00
13	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	MTS Right of Entry Permit (EOC Type I)	600-5	AL	1	\$15,000.00	\$15,000.00
14	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Miscellaneous Agency Fees (EOC Type I)	2-2.3	AL	1	\$90,000.00	\$90,000.00

15	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Drinking Water Discharge Monitoring by QSP	3-12.7.3	LS	1	\$7,400.00	\$7,400.00
16	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Sewage Bypass and Pumping Plan (Diversion Plan)	3-12.5.4	LS	1	\$1,600.00	\$1,600.00
17	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541330	SWPPP Development	1001-3.7	LS	1	\$30,000.00	\$30,000.00
18	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	SWPPP Implementation	1001-3.7	LS	1	\$190,000.00	\$190,000.00
19	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541330	SWPPP Permit Fee (EOC Type I)	1001-3.7	AL	1	\$1,500.00	\$1,500.00

20	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Dewatering Permit and Discharge Fees (EOC Type I)	3-12.8.8	AL	1	\$1,500.00	\$1,500.00
21	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Dewatering Non- Hazardous Contaminated Water	3-12.8.8	LS	1	\$135,000.00	\$135,000.00
22	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238990	Video Recording of Existing Conditions	400-1.1.1	LS	1	\$10,000.00	\$10,000.00
23	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541820	Exclusive Community Liaison Services	5-10.4	LS	1	\$60,000.00	\$60,000.00
24	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238990	Preparation of Hazardous Waste Management Plan and Reporting	5-15.17	LS	1	\$8,000.00	\$8,000.00

25	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541690	Monitoring of Contaminated Soil	5-15.17	LS	1	\$5,300.00	\$5,300.00
26	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238990	Testing, Sampling, Site Storage, and Handling of Petroleum Contaminated Soil	5-15.17	TON	1	\$1,100.00	\$1,100.00
27	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238990	Loading, Transportation, and Disposal of Petroleum Contaminated Soil	5-15.17	TON	1	\$1,700.00	\$1,700.00
28	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238910	Clearing and Grubbing	300-1.4	LS	1	\$38,000.00	\$38,000.00
29	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238910	Tree Removal and Disposal (24-Inch Trunk Diameter and Greater)	401-7	EA	2	\$4,500.00	\$9,000.00

30	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Excavate and Export (Unclassified)	300-2.9	CY	12000	\$48.00	\$576,000.00
31	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Adjust Existing Gate Valve Frame and Cover to Grade	403-5	EA	18	\$700.00	\$12,600.00
32	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Adjust Existing Manhole Frame and Cover to Grade	403-5	EA	9	\$2,800.00	\$25,200.00
33	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Adjust Existing Survey Monument to Grade	403-5	EA	2	\$4,900.00	\$9,800.00
34	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Traffic Signal Loop and Appurtenance Replacement (Type E)	404-12	EA	18	\$800.00	\$14,400.00

35	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Cold Mill AC Pavement (> 1½ Inch - 3 Inch)	404-12	SF	264666	\$0.50	\$132,333.00
36	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Asphalt Pavement Repair	301-1.7	TON	180	\$280.00	\$50,400.00
37	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Miscellaneous Asphalt Patching	301-1.7	TON	100	\$440.00	\$44,000.00
38	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Subgrade Imported Backfill	301-1.7	TON	570	\$14.00	\$7,980.00
39	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Pavement Restoration Adjacent to Trench	302-5.2.1	SF	4500	\$9.00	\$40,500.00

40	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Asphalt Concrete Overlay	302-5.9	TON	3088	\$130.00	\$401,440.00
41	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238910	Concrete Pavement Replacement (8 Inch thick)	302-6.8	CY	23	\$420.00	\$9,660.00
42	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Pavement Fabric	302-7.4	SY	29407	\$2.60	\$76,458.20
43	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Asphalt Concrete ½ Inch Leveling Course	302-7.4	TON	700	\$190.00	\$133,000.00
44	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Crack Seal	302-15.5	LB	500	\$8.00	\$4,000.00

45	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Median Curb Inlet (Type J)	303-1.12	EA	1	\$8,000.00	\$8,000.00
46	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Manholes (5ft x 3ft)	306-16.6	EA	3	\$9,000.00	\$27,000.00
47	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Historical and Contractor Date Stamps and Impressions	303-5.9	EA	13	\$530.00	\$6,890.00
48	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Remove and Replace Existing Sidewalk	303-5.9	SF	200	\$18.00	\$3,600.00
49	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Additional Curb and Gutter Removal and Replacement	303-5.9	LF	275	\$270.00	\$74,250.00

50	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Curb and Gutter (6 Inch Curb, Type G)	303-5.9	LF	150	\$65.00	\$9,750.00
51	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Median Curb and Gutter (Type B3)	303-5.9	LF	261	\$65.00	\$16,965.00
52	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Cross Gutter	303-5.9	SF	1500	\$40.00	\$60,000.00
53	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Curb Ramp (Type A) with Stainless Steel Detectable Warning Tiles	303-5.10.2	EA	4	\$8,000.00	\$32,000.00

54	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Curb Ramp Modified (Type A, Per Sheet 45) with Stainless Steel Detectable Warning Tiles	303-5.10.2	EA	1	\$9,400.00	\$9,400.00
55	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Curb Ramp (Type C1) with Stainless Steel Detectable Warning Tiles	303-5.10.2	EA	10	\$8,700.00	\$87,000.00
56	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Curb Ramp (Type C2) with Stainless Steel Detectable Warning Tiles	303-5.10.2	EA	1	\$9,200.00	\$9,200.00

57	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Curb Ramp Modified (Type D, Per Sheet 48) with Stainless Steel Detectable Warning Tiles	303-5.10.2	EA	7	\$7,200.00	\$50,400.00
58	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Colored Stamped Concrete Raised Median	303-6.5	SF	100	\$55.00	\$5,500.00
59	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Asphalt Concrete Raised Median	303-6.5	SF	800	\$13.00	\$10,400.00
60	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Removal or Abandonment of Existing Water Facilities	306-3.3.4	LF	800	\$26.00	\$20,800.00

61	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Abandon and Fill Existing Water Main Outside of the Trench Limit	306-3.3.4	LF	2500	\$51.00	\$127,500.00
62	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Additional Bedding	306-15.1	CY	720	\$33.00	\$23,760.00
63	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Water Main (66 Inch, Welded Steel) (Excluding Trenchless Crossings)	306-15.1	LF	4140	\$1,930.00	\$7,990,200.00
64	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Water Main (8 Inch, Class C900 PVC)	306-15.1	LF	422	\$210.00	\$88,620.00
65	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Engineered Trench Shoring	306-15.2	LS	1	\$332,000.00	\$332,000.00

66	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Butterfly Valve (66 Inch, Class 200, Triple Offset)	306-15.5	EA	3	\$325,000.00	\$975,000.00
67	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Butterfly Valve Vault	306-15.5	EA	2	\$209,000.00	\$418,000.00
68	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Gate Valve (8 Inch)	306-15.5	EA	3	\$3,700.00	\$11,100.00
69	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Water Valve Bypass for Straight Mainline 16 Inch and Larger	306-15.5	EA	3	\$23,800.00	\$71,400.00
70	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Fire Hydrant Assembly and Marker (6 Inch)	306-15.6	EA	1	\$17,500.00	\$17,500.00

71	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Fire Service Connection (6 Inch)	306-15.6	EA	2	\$9,000.00	\$18,000.00
72	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Meter Assembly	306-15.8	EA	3	\$10,500.00	\$31,500.00
73	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Temporary Resurfacing	306-15.9 AND 901- 1.3	TON	565	\$125.00	\$70,625.00
74	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Insertion Flow Meter	306-15.8	EA	1	\$93,000.00	\$93,000.00
75	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Water Service (1 Inch)	306-15.8	EA	3	\$4,600.00	\$13,800.00

76	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Water Service Transfer (1 Inch)	306-15.8	EA	5	\$3,500.00	\$17,500.00
77	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Blow-Off Valve Assembly (2 Inch)	306-15.8	EA	1	\$9,200.00	\$9,200.00
78	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Blow-Off Valve Assembly (6 Inch)	306-15.8	EA	4	\$8,500.00	\$34,000.00
79	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Air and Vacuum (Air Release) Valve Assembly (6 Inch, Class 150)	306-15.8	EA	8	\$13,300.00	\$106,400.00
80	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Sewer Lateral and Cleanout	306-17.2	EA	6	\$4,500.00	\$27,000.00

81	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Imported Trench Backfill	306-15.11	TON	4000	\$40.00	\$160,000.00
82	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	TUNNEL: 108" SDCWA Pipeline Crossing, Sta. 45+42 to 45+69	307-2.10	LF	27	\$45,000.00	\$1,215,000.00
83	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	TUNNEL: Interstate 8 Pipeline Crossing	307-2.10	LF	716	\$14,210.00	\$10,174,360.00
84	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Paint Striping	314-4.3.7 AND 314- 4.4.6	LS	1	\$158,500.00	\$158,500.00
85	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Traffic Control	601-7	LS	1	\$612,500.00	\$612,500.00

86	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	SDG&E Service Orders	701-2	LS	1	\$25,000.00	\$25,000.00
87	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	SDG&E Fee Allowance (EOC Type I)	701-2	AL	1	\$5,000.00	\$5,000.00
88	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	Remove and Reinstall Existing Light Pole	701-2	EA	2	\$10,500.00	\$21,000.00
89	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	Traffic Signal Modification	701-2	EA	6	\$53,000.00	\$318,000.00
90	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Curb Ramp Barricade	701-2	EA	2	\$530.00	\$1,060.00

91	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	Electrical Work	701-2	LS	1	\$207,000.00	\$207,000.00
92	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	Fiber Optic Conduit	701-2	LS	1	\$410,000.00	\$410,000.00
93	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	561730	Landscape work	801-9	LS	1	\$45,000.00	\$45,000.00
94	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	561730	Irrigation System	801-9	LS	1	\$35,000.00	\$35,000.00
95	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	541330	25-Month Revegetation Maintenance and Monitoring Program	802-4	LS	1	\$25,000.00	\$25,000.00

96	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Contractor Furnished Materials for City Forces Connection, Cut and Plug, and Cut- in Work for Mains 16-Inch and Larger.	900-2.3	EA	2	\$500.00	\$1,000.00
97	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	High-lining Installation by the Contractor	901-1.3	LF	1817	\$17.00	\$30,889.00
98	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	High-lining Removed by the Contractor	901-1.3	LF	1817	\$6.00	\$10,902.00
99	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Connections to the Existing System by Contractor (8 Inch through 12 Inch)	901-2.5	EA	5	\$7,000.00	\$35,000.00

100	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Connections to the Existing System by Contractor (66 Inch)	901-2.5	EA	1	\$36,000.00	\$36,000.00
101	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Cathodic Protection System	16640	LS	1	\$220,000.00	\$220,000.00
102	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237990	Hyperbaric Intervention (EOC Type I)	2443	AL	1	\$100,000.00	\$100,000.00
103	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Pavement Restoration for Final Connection	901-2.5	SF	500	\$21.00	\$10,500.00
104	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Helix Water District Waterline Improvements	306-15.1	LS	1	\$578,000.00	\$578,000.00

105	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237310	Concrete Raised Median	303-6.5	SF	1700	\$18.00	\$30,600.00
106	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238910	Tree Removal (24- Inch Trunk Diameter and Greater) - Lake Murray Blvd	401-7	EA	5	\$2,400.00	\$12,000.00
107	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	New City of La Mesa Gateway Sign	7-3.1	LS	1	\$26,400.00	\$26,400.00
108	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238210	Remove and Reinstall Existing Light Pole	701-2	EA	2	\$13,000.00	\$26,000.00
109	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	561730	Landscaping Work Lake Murray Blvd	801-9	LS	1	\$33,000.00	\$33,000.00

110	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	561730	Irrigation System - Lake Murray Blvd	801-9	LS	1	\$46,000.00	\$46,000.00
111	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	238990	Testing, Sampling, Site Storage, Handling, Transportation, and Disposal of Non-RCRA Hazardous Waste Contamination from the Treatment of Contaminated Ground Water	5-15.17	GAL	500	\$100.00	\$50,000.00
112	Main Bid Montezuma PPL/Mid-City Pipeline Ph2	237110	Connection to Existing Valve Vault No. 3	901-2.5	EA	1	\$103,000.00	\$103,000.00
							Subtotal	\$33,224,042.20

113	Main Bid 70TH- Alvarado to Saranac- Sidewalk	524126	Bonds (Payment and Performance)	1-7.2.1	LS	1	\$15,000.00	\$15,000.00
114	Main Bid 70TH- Alvarado to Saranac- Sidewalk	237310	Mobilization	7-3.4.1	LS	1	\$25,000.00	\$25,000.00
115	Main Bid 70TH- Alvarado to Saranac- Sidewalk		Field Orders (EOC Type II)	7-3.9	AL	1	\$15,000.00	\$15,000.00
116	Main Bid 70TH- Alvarado to Saranac- Sidewalk	238910	Clearing and Grubbing	300-1.4	LS	1	\$31,300.00	\$31,300.00
117	Main Bid 70TH- Alvarado to Saranac- Sidewalk	238110	Gravity Retaining Wall	303-1.12	SF	235	\$95.00	\$22,325.00
118	Main Bid 70TH- Alvarado to Saranac- Sidewalk	237310	Curb and Gutter (8 Inch Curb, Type G)	303-5.9	LF	600	\$55.00	\$33,000.00

119	Main Bid 70TH- Alvarado to Saranac- Sidewalk	237310	Curb Ramp (Type C1) with Detectable Warning Tiles	303-5.10.2	EA	2	\$8,000.00	\$16,000.00
120	Main Bid 70TH- Alvarado to Saranac- Sidewalk	237310	Additional Sidewalk	303-5.10.2	SF	3000	\$25.00	\$75,000.00
121	Main Bid 70TH- Alvarado to Saranac- Sidewalk	238990	Chain Link Fence (Black Vinyl Coated, H=4')	304-3.4	LF	140	\$50.00	\$7,000.00
122	Main Bid 70TH- Alvarado to Saranac- Sidewalk	238210	Remove Existing Pedestrian Push Button	701-2	EA	2	\$500.00	\$1,000.00
123	Main Bid 70TH- Alvarado to Saranac- Sidewalk	238210	Bidirectional Pedestrian Push Button	701-2	EA	1	\$5,000.00	\$5,000.00
124	Main Bid 70TH- Alvarado to Saranac- Sidewalk	237310	Pedestrian Barricade	701-2	EA	1	\$1,500.00	\$1,500.00

125	Main Bid 70TH- Alvarado to Saranac- Sidewalk	237310	Paint Striping	314-4.3.7	LS	1	\$5,000.00	\$5,000.00
126	Main Bid 70TH- Alvarado to Saranac- Sidewalk	541330	WPCP Development	1001-4.2	LS	1	\$1,500.00	\$1,500.00
127	Main Bid 70TH- Alvarado to Saranac- Sidewalk	237310	WPCP Implementation	1001-4.2	LS	1	\$25,000.00	\$25,000.00
							Subtotal	\$278,625.00
128	Additive Alternate Items A	237110	8-Inch Sewer Main (La Mesa)	306-15.1	LF	373	\$270.00	\$100,710.00
129	Additive Alternate Items A	237110	Manholes (5ft x 3ft) (La Mesa)	306-16.6	EA	4	\$9,000.00	\$36,000.00
							Subtotal	\$136,710.00
130	Deductive Alternate Items B	237310	Cold Mill AC Pavement (2 Inch) (La Mesa)	404-12	SF	99900	(\$0.50)	(\$49,950.00)
131	Deductive Alternate Items B	237310	Asphalt Concrete Overlay (2 Inch) (La Mesa)	302-5.9	TON	1020	(\$120.00)	(\$122,400.00)

132	Deductive Alternate Items B	237310	Adjust Existing Manhole Frame and Cover to Grade (La Mesa)	403-5	EA	6	(\$2,000.00)	(\$12,000.00)
133	Deductive Alternate Items B	237310	Adjust existing Gate Valve Frame and Cover to Grade (La Mesa)	403-5	EA	2	(\$1,150.00)	(\$2,300.00)
134	Deductive Alternate Items B	237310	Adjust Existing Survey Monument to Grade (La Mesa)	403-5	EA	1	(\$4,500.00)	(\$4,500.00)
135	Deductive Alternate Items B	237310	Striping (70th St and Lake Murray Blvd - La Mesa)	314-4.3.7 AND 314-4.4.6	LS	1	(\$5,000.00)	(\$5,000.00)
							Subtotal	(\$196,150.00)
							Total	\$33,443,227.20