

City of San Diego

CONTRACTOR'S NAME: PK MECHANICAL SYSTEMS, INC.
ADDRESS: 21335 Bundy Canyon Road, Wildomar CA, 92595
TELEPHONE NO.: (951) 245-5537 FAX NO.: (951) 226-1171
CITY CONTACT: Juan E. Espindola - Contract Specialist, Email: JEEspindola@sandiego.gov
Phone No. (619) 533-4491, Fax No. (619) 533-3633
J. Gallardo/J. Borja/Lad

BIDDING DOCUMENTS



FOR

ORIGINAL

Tyrian St. and Soledad Ave. and AC Water Main

BID NO.: K-16-1223-DBB-3
SAP NO. (WBS/IO/CC): B-12111(S)/B-15216(W)
CLIENT DEPARTMENT: 2011/2013
COUNCIL DISTRICT: 1
PROJECT TYPE: JA/KB

THIS CONTRACT WILL BE SUBJECT TO THE FOLLOWING:

- PHASED-FUNDING
- THE CITY'S SUBCONTRACTING PARTICIPATION REQUIREMENTS FOR SLBE PROGRAM.
- APPRENTICESHIP
- PREVAILING WAGE RATES: STATE FEDERAL

BID DUE DATE:

2:00 PM

MAY 5, 2016

CITY OF SAN DIEGO

PUBLIC WORKS CONTRACTS

1010 SECOND AVENUE, 14th FLOOR, MS 614C

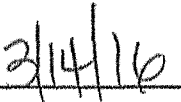
SAN DIEGO, CA 92101

ENGINEER OF WORK

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



For City Engineer



Date

Seal



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NOTICE INVITING BIDS

1. **SUMMARY OF WORK:** This is the City of San Diego's (City) solicitation process to acquire Construction services for **Tyrian St. and Soledad Ave. and AC Water Main** For additional information refer to Attachment A.
2. **FULL AND OPEN COMPETITION:** This contract is open to full competition and may be bid on by Contractors who are on the City's current Prequalified Contractors' List. For information regarding the Contractors Prequalified list visit the City's website: <http://www.sandiego.gov>.
3. **ESTIMATED CONSTRUCTION COST:** The City's estimated construction cost for this project is **\$1,645,000**.
4. **BID DUE DATE AND TIME ARE: MAY 5, 2016 AT 2:00 PM.**
5. **PREVAILING WAGE RATES APPLY TO THIS CONTRACT:** Refer to Attachment D.
6. **LICENSE REQUIREMENT:** The City has determined that the following licensing classifications are required for this contract: A or C34.
7. **SUBCONTRACTING PARTICIPATION PERCENTAGES:** 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 **6.8%**
 2. ELBE participation **15.5%**
 3. Total mandatory participation **22.3%**
- 7.1. The Bid may be declared non-responsive if the Bidder fails the following mandatory conditions:
 - 7.1.1. Bidder's inclusion of SLBE-ELBE certified subcontractors at the overall mandatory participation percentage identified in this document; **OR**
 - 7.1.2. Bidder's submission of 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.
8. **PRE-BID MEETING:**
 - 8.1. Prospective Bidders are encouraged to attend the Pre-Bid Meeting. The purpose of the meeting is to discuss the scope of the Project, submittal requirements, the pre-qualification process and any Equal Opportunity Contracting Program requirements

and reporting procedures. To request a sign language or oral interpreter for this visit, call the Public Works Contracts Division at (619) 533-3450 at least 5 Working Days prior to the meeting to ensure availability. The Pre-Bid meeting is scheduled as follows:

Date: April 12, 2016

Time: At 10:00 AM

Location: 1010 Second Avenue, Suite 1400, San Diego, CA 92101

Attendance at the Pre-Submittal Meeting will be evidenced by the Bidder's representative's signature on the attendance roster. It is the responsibility of the Bidder's representative to complete and sign the attendance roster.

9. AWARD PROCESS:

9.1. 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.

9.2. Upon acceptance of a Bid, the City will prepare contract documents for execution within approximately 21 days of the date of the Bid opening. The City will then award the Contract within approximately 14 days of receipt of properly signed Contract, bonds, and insurance documents.

9.3. 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.

9.4. The low Bid will be determined by Base Bid alone

9.5. Once the low bid has been determined, the City may, at its sole discretion, award the contract for the Base bid plus one or more alternates.

10. SUBMISSION OF QUESTIONS:

10.1. The Director (or designee), of the 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. All questions related to this solicitation shall be submitted to:

Public Works Contracts
1010 Second Avenue, 14th Floor
San Diego, California, 92101
Attention: Juan E. Espindola – Contract Specialist

OR:

JEEspindola@sandiego.gov

- 10.2. Questions received less than 14 days prior to the date for opening of Bids may not be considered.
 - 10.3. 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.
 - 10.4. 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.
11. **PHASED FUNDING:** For Phased Funding Conditions, see Attachment B.
 12. **ADDITIVE/DEDUCTIVE ALTERNATES:**
 - 12.1. 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.
 - 12.2. 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. Complete information and links to the on-line prequalification application are available at:

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

- 1.2. The completed application must be submitted online no later than 2 weeks prior to the bid opening. For additional information or the answer to questions about the prequalification program, contact David Stucky at 619-533-3474 or dstucky@sandiego.gov.
- 1.3. Due to the City's fiduciary requirement to safeguard vendor data, 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 an 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 which 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 in 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 (90 days for federally funded contracts and contracts valued at \$500,000 or less) 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.shtml>.
- 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 10 Working Days after receiving the Contract forms. See 2-1.1.2, “Joint Venture Contractors” in The WHITEBOOK for details.
7. **PREVAILING WAGE RATES WILL APPLY:** Refer to Attachment D.
8. **SUBCONTRACTING PARTICIPATION PERCENTAGES:** Subcontracting participation percentages apply to this contract. Refer to Attachment E.
9. **INSURANCE REQUIREMENTS:**
- 9.1. 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.

9.2. Refer to sections 7-3, "LIABILITY INSURANCE", and 7-4, "WORKERS' COMPENSATION INSURANCE" of the Supplementary Special Provisions (SSP) for the insurance requirements which must be met.

10. **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")	2012	PITS070112-01
City of San Diego Standard Specifications for Public Works Construction ("The WHITEBOOK")*	2012	PITS070112-02
City of San Diego Standard Drawings*	2012	PITS070112-03
Caltrans Standard Specifications	2010	PITS070112-04
Caltrans Standard Plans	2010	PITS070112-05
California MUTCD	2012	PITS070112-06
City Standard Drawings - Updates Approved For Use (when specified)*	Varies	Varies
Standard Federal Equal Employment Opportunity Construction Contract Specifications and the Equal Opportunity Clause Dated 09-11-84	1984	769023
NOTE: *Available online under Engineering Documents and References at: http://www.sandiego.gov/publicworks/edocref/index.shtml		

11. **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 addendum are made effective as though originally issued with the Bid. The Bidders shall acknowledge the receipt of Addenda at the time of bid submission.

12. **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.

13. **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.

14. SUBCONTRACTOR INFORMATION:

14.1. **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 further state within the description, the **PORTION** 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 - General; Paragraph 2-3 Subcontracts, 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.

14.2. **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)** 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.

14.3. **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.

15. SUBMITTAL OF "OR EQUAL" ITEMS: See Section 4-1.6, "Trade Names or Equals" in The WHITEBOOK and as amended in the SSP.

16. AWARD PROCESS:

- 16.1. The Award of this contract is contingent upon the Contractor's compliance with all conditions precedent to Award.
- 16.2. 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.
- 16.3. 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.
17. **SUBCONTRACT LIMITATIONS:** The Bidder's attention is directed to Standard Specifications for Public Works Construction, Section 2-3, "SUBCONTRACTS" 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.
18. **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.
19. **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.
20. **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.
21. **BIDDER'S GUARANTEE OF GOOD FAITH (BID SECURITY):**
 - 21.1. 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.
 - 21.2. 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.

- 21.3. 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.
- 21.4. 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.
- 21.5. 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**.

22. AWARD OF CONTRACT OR REJECTION OF BIDS:

- 22.1. This contract may be awarded to the lowest responsible and reliable Bidder.
- 22.2. Bidders shall complete ALL eBid forms as required by this solicitation. Incomplete eBids will not be accepted.
- 22.3. 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.
- 22.4. 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.
- 22.5. 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.
- 22.6. 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.
- 22.7. 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.
- 22.8. 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.

23. BID RESULTS:

- 23.1. 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.
- 23.2. 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.

24. THE CONTRACT:

- 24.1. 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.
- 24.2. 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.
- 24.3. 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.
- 24.4. 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.
- 24.5. 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 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.

- 25. 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 2-7, 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.
- 26. CITY STANDARD PROVISIONS:** This contract is subject to the following standard provisions. See The WHITEBOOK for details.
- 26.1. The City of San Diego Resolution No. R-277952 adopted on May 20, 1991 for a Drug-Free Workplace.
 - 26.2. The City of San Diego Resolution No. R-282153 adopted on June 14, 1993 related to the Americans with Disabilities Act.
 - 26.3. The City of San Diego Municipal Code §22.3004 for Pledge of Compliance.
 - 26.4. The City of San Diego's Labor Compliance Program and the State of California Labor Code §§1771.5(b) and 1776.
 - 26.5. 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.
 - 26.6. The City's Equal Benefits Ordinance (EBO), Chapter 2, Article 2, Division 43 of The San Diego Municipal Code (SDMC).
 - 26.7. The City's Information Security Policy (ISP) as defined in the City's Administrative Regulation 90.63.
- 27. PRE-AWARD ACTIVITIES:**
- 27.1. 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**.
 - 27.2. 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:

PK MECHANICAL SYSTEMS, INC., a corporation, as principal, and
U.S. SPECIALTY 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
ONE MILLION FOUR HUNDRED AND THIRTEEN THOUSAND NINE HUNDRED DOLLARS
AND ZERO CENTS (\$1,413,900.00) for the faithful performance of the annexed contract, and in the
sum of ONE MILLION FOUR HUNDRED AND THIRTEEN THOUSAND NINE HUNDRED
DOLLARS AND ZERO CENTS (\$1,413,900.00) 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.

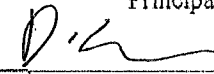
PERFORMANCE BOND, LABOR AND MATERIALMEN'S BOND
(continued)

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

Dated MAY 23, 2016


Approved as to Form

PK Mechanical Systems, Inc.
Principal

By 

David Spindler, CEO

Printed Name of Person Signing for Principal


Jan I. Goldsmith, City Attorney
By 
Deputy City Attorney

U.S. SPECIALTY INSURANCE COMPANY
Surety

By 
MARK D. IATAROLA, Attorney-in-fact

Approved:

601 SOUTH FIGUEROA STREET, SUITE 1600
Local Address of Surety

By 
Eleina Felix Yackel, Senior Contract Specialist
Public Works Department

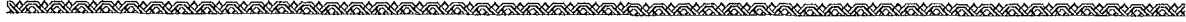
LOS ANGELES, CA 90017
Local Address (City, State) of Surety

310/649-0990
Local Telephone No. of Surety

PREMIUM IS FOR CONTRACT TERM AND IS SUBJECT TO ADJUSTMENT BASED ON FINAL CONTRACT PRICE Premium \$ 15,151.00
Bond No. 1001005986

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189



A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of SAN DIEGO)

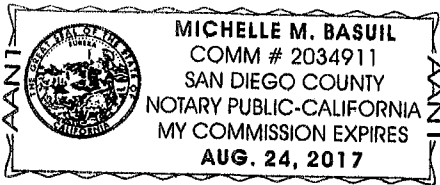
On 5/23/2016 before me, MICHELLE M. BASUIL, NOTARY PUBLIC
Date Here Insert Name and Title of the Officer

personally appeared MARK D. IATAROLA
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/~~she~~/they executed the same in his/~~her~~/their authorized capacity(ies), and that by his/~~her~~/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Signature *Michelle M. Basuil*
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____ Document Date: _____

Number of Pages: _____ Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: MARK D. IATAROLA

- Corporate Officer — Title(s): _____
- Partner — Limited General
- Individual Attorney in Fact
- Trustee Guardian or Conservator
- Other: _____

Signer Is Representing: _____

Signer's Name: _____

- Corporate Officer — Title(s): _____
- Partner — Limited General
- Individual Attorney in Fact
- Trustee Guardian or Conservator
- Other: _____

Signer Is Representing: _____

POWER OF ATTORNEY

AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY

KNOW ALL MEN BY THESE PRESENTS: That American Contractors Indemnity Company, a California corporation, Texas Bonding Company, an assumed name of American Contractors Indemnity Company, United States Surety Company, a Maryland corporation and U.S. Specialty Insurance Company, a Texas corporation (collectively, the "Companies"), do by these presents make, constitute and appoint:

John G. Maloney, Mark D. Iatarola or Helen Maloney of Escondido, California

its true and lawful Attorney(s)-in-fact, each in their separate capacity if more than one is named above, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver any and all bonds, recognizances, undertakings or other instruments or contracts of suretyship to include riders, amendments, and consents of surety, providing the bond penalty does not exceed *****Fifteen Million***** Dollars (\$ **15,000,000.00**).

This Power of Attorney shall expire without further action on December 20, 2017. This Power of Attorney is granted under and by authority of the following resolutions adopted by the Boards of Directors of the Companies:

Be it Resolved, that the President, any Vice-President, any Assistant Vice-President, any Secretary or any Assistant Secretary shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-Fact to represent and act for and on behalf of the Company subject to the following provisions:

Attorney-in-Fact may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements or indemnity and other conditional or obligatory undertakings, including any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts, and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be binding upon the Company as if signed by the President and sealed and effected by the Corporate Secretary.

Be it Resolved, that the signature of any authorized officer and seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile and any power of attorney or certificate bearing facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, The Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 1st day of December, 2014.

AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY

Corporate Seals



By:

[Signature]
Daniel P. Aguilar, Vice President

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Los Angeles SS:

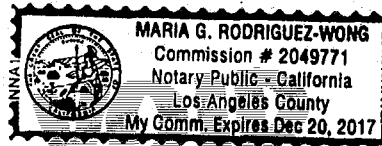
On this 1st day of December, 2014, before me, Maria G. Rodriguez-Wong, a notary public, personally appeared Dan P. Aguilar, Vice President of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.
WITNESS my hand and official seal.

Signature

[Signature]

(Seal)



I, Michael Chalekson, Assistant Secretary of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Los Angeles, California this 23RD day of MAY, 2016.

Corporate Seals

Bond No. 1001005986
Agency No. 4013



[Signature]
Michael Chalekson, Assistant Secretary

**Kan't Kopy® K1
Security Paper**

- Hidden Pantograph
- Color Match
- Artificial Watermark
- Anti-Copy Coin Rub
- Erasure Protection
- Security Features Box
- Microprint Protection
- Acid Free

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- Security Features Box
- Microprint Protection
- Acid Free

ATTACHMENTS

ATTACHMENT A
SCOPE OF WORK

SCOPE OF WORK

1. **SCOPE OF WORK:** . Construction of Tyrian St and Soledad Ace and AC Water Main consist of the installation of approximately 1,261 linear feet of new 8-inch sewer main and rehabilitation of approximately 100 linear feet of existing 8-inch sewer main. Installation includes sewer laterals, re-plumb lateral, and manholes. Water infrastructure consist of replacement of existing 6-inch, 8-inch, 12-inch and 16-inch asbestos cement water mains with approximately 1,369.07 linear feet of which 867 feet of 8-inch water main, 144 feet of 12-inch water main, and 358 feet of 16-inch water main; including services, fire hydrants and pressure reducing station. In addition, installing curb ramps, street resurfacing, traffic control plans, and all other work and appurtenances in accordance with these specifications and drawings numbered 37411-01-D through 37411-27-D.
 - 1.1. The Work shall be performed in accordance with:
 - 1.1.1. The Notice Inviting Bids and Plans numbered **37411-01-D** through **37411-27-D**, inclusive.
2. **LOCATION OF WORK: The location of the Work is as follow:**

See the Location Maps attached in Appendix E.
3. **CONTRACT TIME:** The Contract Time for completion of the Work shall be **120 Working Days**.

ATTACHMENT B
PHASED FUNDING PROVISIONS

PHASED FUNDING PROVISIONS

4. PHASED FUNDING:

- 4.1. For phased funded contracts, the City typically secures enough funds for the first 90 days of the contract prior to award. Within 10 Working Days after Bid opening date the Apparent Low Bidder must contact the Project Manager to discuss fund availability and the duration of the first phase and submit the Pre-Award Schedule to the City for approval and preparation of the first Phased Funding Schedule Agreement.
- 4.2. The Apparent Low Bidder will be required to provide a Pre-award Schedule in accordance with 6-1, "CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK" and 9-3, "PAYMENT" prior to award of Contract.
- 4.3. If the Bid submitted by the Apparent Low Bidder is rejected by the City for any reason, the next Apparent Low Bidder is to provide the Pre-Award Schedule within 5 Working Days after receiving notice. This process will continue until the City has selects an Awardee or rejects all Bids.
- 4.4. The first Phased Funding Schedule Agreement must show the fund availability for the first phase. Upon selection of the Awardee and acceptance by the City of the Pre-Award Schedule, the City will present the first Phased Funding Schedule Agreement to you.
- 4.5. At the City's request, meet with the City's project manager before execution of the first Phased Funding Schedule Agreement to discuss their comments and requests for revision to the Pre-Award Schedule.
- 4.6. Your failure to perform the any of the following may result in the Bid being rejected as non-responsive:
 1. Meet with the City's project manager, if requested to do so, to discuss and respond to the City's comments regarding the Pre-Award Schedule,
 2. Revise the Pre-Award Schedule as requested by the City within the specified 22 Working Days timeframe, or
 3. Execute the first Phased Funding Schedule Agreement within a day after receipt.

PHASED FUNDING SCHEDULE AGREEMENT

Check one:

- First Phased Funding Schedule Agreement
- Final Phased Funding Schedule Agreement

PROPOSAL NUMBER: K-16-1223-DBB-3
CONTRACT OR TASK TITLE: TYRIAN ST AND SOLEDAD AVE AND AC WATER MAIN
CONTRACTOR: PK MECHANICAL SYSTEMS

Funding Phase	Phase Description	Phase Start	Phase Finish	Not-to-Exceed Amount
1	Construction of Tyrian St and Soledad Ave and AC Water Main consist of the installation of approximately 1,261 LF of new 8-inch sewer main and rehabilitation of approximately 100 LF of existing 8-inch sewer main. Installation includes sewer laterals, re-plum laterals and manholes. Water infrastructure consist of replacement of existing AC water mains with approximately 1,369 LF of 8-inch, 12-inch and 16-inch water main; including services, fire hydrants and pressure reducing station. In addition, installing curb ramps, street resurfacing, traffic control plans and all work and appurtenances in accordance with these specifications and drawings numbered 37411-01-D through 37411-27-D .	Notice to Proceed	Notice of Completion	<u>Sewer</u> \$ 643,536.00 <u>Water</u> \$ 770,364.00
2				
Total				\$ 1,413,900.00

Notes:

- (1) City Supplement 9-3.6, "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 a written modification to the CONTRACT.

CITY OF SAN DIEGO
 By: [Signature]
 Name: Jericho Gallardo
 Project Manager

Department Name: Public Works - Engineering
 Date: 05/19/2016

CONTRACTOR
 By: [Signature]
 Name: David Spindler

Title: CEO
 Date: 5/18/16

-END OF PHASED FUNDING SCHEDULE AGREEMENT-

PHASED FUNDING SCHEDULE AGREEMENT

Check one:

- First Phased Funding Schedule Agreement
 Final Phased Funding Schedule Agreement

NOTE: THIS IS A SAMPLE PHASED FUNDING SCHEDULE AGREEMENT FORM.

The particulars left blank in this sample 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 subsequent Schedules submitted to and approved by the City.

BID NUMBER: _____

CONTRACT OR TASK TITLE: _____

CONTRACTOR: _____

Funding Phase	Phase Description	Phase <u>Start</u>	Phase <u>Finish</u>	Not-to-Exceed Amount
1				\$
	<u>Additional phases to be added</u>			
	<u>to this form as necessary.</u>			
Total				\$

Notes:

- (1) City Supplement 9-3.6, "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 a written modification to the CONTRACT.

CITY OF SAN DIEGO

CONTRACTOR

By: _____

By: _____

Name: _____

Name: _____

Project Manager

Department Name: _____

Title: _____

Date: _____

Date: _____

END OF PHASED FUNDING SCHEDULE AGREEMENT

ATTACHMENT C

EQUAL OPPORTUNITY CONTRACTING PROGRAM

EQUAL OPPORTUNITY CONTRACTING PROGRAM REQUIREMENTS

1. To The WHITEBOOK, Chapter 10, Sections D and E, DELETE each in its entirety, and SUBSTITUTE with the following:

D. CITY'S EQUAL OPPORTUNITY COMMITMENT.

1. Nondiscrimination in Contracting Ordinance.

1. The Contractor, Subcontractors and Suppliers shall comply with requirements of the City's Nondiscrimination in Contracting Ordinance, San Diego Municipal Code §§22.3501 through 22.3517.

The Contractor shall not discriminate on the basis of race, gender, religion, national origin, ethnicity, sexual orientation, age, or disability in the solicitation, selection, hiring, or treatment of subcontractors, vendors, or suppliers. The Contractor shall provide equal opportunity for subcontractors to participate in subcontracting opportunities. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the contract and may result in contract termination, debarment, or other sanctions.

The Contractor shall include the foregoing clause in all contracts between the Contractor and Subcontractors and Suppliers.

2. Disclosure of Discrimination Complaints. As part of its Bid or Proposal, 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 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.
3. Upon the City's request, the Contractor agrees to provide to the City, within 60 days, a truthful and complete list of the names of all Subcontractors and Suppliers that the Contractor has used in the past 5 years on any of its contracts that were undertaken within San Diego County, including the total dollar amount paid by the Contractor for each subcontract or supply contract.
4. The Contractor further agrees to fully cooperate in any investigation conducted by the City pursuant to the City's Nondiscrimination in Contracting Ordinance, Municipal Code §§22.3501 through 22.3517. The Contractor understands and agrees that violation of this clause shall be considered a material breach of the Contract and may result in remedies being ordered against the Contractor up to and including contract termination, debarment and other sanctions for violation of the provisions of the Nondiscrimination in Contracting Ordinance. The Contractor further understands and agrees that the procedures, remedies and sanctions provided for in the Nondiscrimination in Contracting Ordinance apply only to violations of the Ordinance.

E. EQUAL EMPLOYMENT OPPORTUNITY OUTREACH PROGRAM.

1. The Contractor, Subcontractors and Suppliers shall comply with the City's Equal Employment Opportunity Outreach Program, San Diego Municipal Code §§22.2701 through 22.2707.

The Contractor shall not discriminate against any employee or applicant for employment on any basis prohibited by law. Contractor shall provide equal opportunity in all employment practices. Prime Contractor shall ensure their subcontractors comply with this program. Nothing in this section shall be interpreted to hold a prime contractor liable for any discriminatory practice of its subcontractors.

The Contractor shall include the foregoing clause in all contracts between the Contractor and Subcontractors and Suppliers.

2. If the Contract is competitively solicited, the selected Bidder shall submit a Work Force Report (Form BB05), within 10 Working Days after receipt by the Bidder of Contract forms to the City for approval as specified in the Notice of Intent to Award letter from the City.
3. If a Work Force Report is submitted, and the City determines there are under-representations when compared to County Labor Force Availability data, the selected Bidder shall submit an Equal Employment Opportunity Plan.
4. If the selected Bidder submits an Equal Employment Opportunity Plan, it shall include the following assurances:
 1. The Contractor shall maintain a working environment free of discrimination, harassment, intimidation and coercion at all sites and in all facilities at which the Contractor's employees are assigned to work.
 2. The Contractor reviews its EEO Policy, at least annually, with all on-site supervisors involved in employment decisions.
 3. The Contractor disseminates and reviews its EEO Policy with all employees at least once a year, posts the policy statement and EEO posters on all company bulletin boards and job sites, and documents every dissemination, review and posting with a written record to identify the time, place, employees present, subject matter, and disposition of meetings.
 4. The Contractor reviews, at least annually, all supervisors' adherence to and performance under the EEO Policy and maintains written documentation of these reviews.
 5. The Contractor discusses its EEO Policy Statement with subcontractors with whom it anticipates doing business, includes the EEO Policy Statement in its subcontracts, and provides such documentation to the City upon request.

6. The Contractor documents and maintains a record of all bid solicitations and outreach efforts to and from subcontractors, contractor associations and other business associations.
7. The Contractor disseminates its EEO Policy externally through various media, including the media of people of color and women, in advertisements to recruit, maintains files documenting these efforts, and provides copies of these advertisements to the City upon request.
8. The Contractor disseminates its EEO Policy to union and community organizations.
9. The Contractor provides immediate written notification to the City when any union referral process has impeded the Contractor's efforts to maintain its EEO Policy.
10. The Contractor maintains a current list of recruitment sources, including those outreaching to people of color and women, and provides written notification of employment opportunities to these recruitment sources with a record of the organizations' responses.
11. The Contractor maintains a current file of names, addresses and phone numbers of each walk-in applicant, including people of color and women, and referrals from unions, recruitment sources, or community organizations with a description of the employment action taken.
12. The Contractor encourages all present employees, including people of color and women employees, to recruit others.
13. The Contractor maintains all employment selection process information with records of all tests and other selection criteria.
14. The Contractor develops and maintains documentation for on-the-job training opportunities, participates in training programs, or both for all of its employees, including people of color and women, and establishes apprenticeship, trainee, and upgrade programs relevant to the Contractor's employment needs.
15. The Contractor conducts, at least annually, an inventory and evaluation of all employees for promotional opportunities and encourages all employees to seek and prepare appropriately for such opportunities.
16. The Contractor ensures the company's working environment and activities are non-segregated except for providing separate or single-user toilets and necessary changing facilities to assure privacy between the sexes.

ATTACHMENT D
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.
 - 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.** For contracts entered into on or after April 1, 2015, Contractor and their subcontractors shall 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 design professionals 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 Equal Opportunity Contracting Department at 619-236-6000.
- 1.9. Contractor and Subcontractor Registration Requirements.** This project is subject to compliance monitoring and enforcement by the DIR. As of March 1, 2015, no contractor or subcontractor may be listed on a bid or proposal for a public works project unless registered with the DIR pursuant to Labor Code section 1725.5. As of April 1, 2015, a contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, or enter into any contract for public work, unless currently registered and qualified to perform public work pursuant to Labor Code section 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 DIR in compliance with Labor Code sections 1771.1 and 1725.5, and Contractor shall provide proof of registration to the City upon request.

- 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.

ATTACHMENT E
SUPPLEMENTARY SPECIAL PROVISIONS

SUPPLEMENTARY SPECIAL PROVISIONS

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

- 1) Standard Specifications for Public Works Construction (The GREENBOOK) currently in effect.
 - 2) The City of San Diego Standard Specifications for Public Works Construction (The WHITEBOOK).
-

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

1-2 TERMS AND DEFINITIONS.

Normal Working Hours. To the City Supplement, ADD the following:

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

SECTION 2 - SCOPE AND CONTROL OF WORK

2-3.2 Self Performance. DELETE in its entirety and SUBSTITUTE with the following:

1. You must perform, with your own organization, Contract work amounting to at least 50% of the base bid alone or base bid and any additive or deductive alternate(s) that together when added or deducted form the basis of award.
2. The self-performance percentage requirement will be waived for contracts when a “B” License is required or allowed.

2-5.3.1 General. To the City Supplement, ADD the following

7. For products for which an AML is available, products listed in the AML shall be used. A submittal review will be conducted for products not identified on an AML on a case-by-case basis when:
 - a) The product type or category is not in the AML.
 - b) The AML does not list at least two available manufacturers of the product.
 - c) The material or manufacturer listed in the AML is no longer available. Documentation to substantiate the product is no longer available or in production is required as part of the submittal.

In the case of conducting a submittal review when required by the Plans or Special Provisions, or when requested by the Engineer, all submittals shall be accompanied by the City's submittal form.

The Product Submittal Form is available for download at:

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

2-5.3.2 Working Drawings. TABLE 2-5.3.2(A), ADD the following:

Item	Section No.	Title	Subject
17	306-1.6	Water Valve Bypass for Mainlines 16" and Larger	SDW-154*

*Note: The distance dimensions shown between the bypass pipes and the mainlines are subject to change to field conditions.

2-7 SUBSURFACE DATA. ADD the following:

4. In preparation of the Contract Documents, the designer has relied upon the following reports of explorations and tests of subsurface conditions at the Work Site:
 1. Report of Geotechnical Evaluation dated November 1, 2013 by Ninyo & Moore and Associates.
5. The report(s) listed above is(are) available for review by contacting the Contract Specialist or visiting:

<ftp://ftp.sannet.gov/OUT/ECP/2-7%20SUBSURFACE%20DATA/>

2-9.1 Permanent Survey Markers. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

1. Pursuant to Division 3, Chapter 15 of the Business and Professions Code, you shall not disturb survey monuments that "control the location of subdivisions, tracts, boundaries, roads, streets, or highways, or provide horizontal or vertical survey control" until they have been tied out by a Registered Land Surveyor or Registered Civil Engineer authorized to practice land surveying within the State of California.
2. Monument Preservation shall be performed by the City's Construction Management and Field Services (CMFS) Division on all Projects, unless permission is obtained for these services in writing by CMFS.
3. You shall submit to the Engineer a minimum of 7 Days prior to the start of the Work a list of controlling survey monuments which may be disturbed. CMFS shall do the following:
 - a) Set survey points outside the affected Work area that reference and locate each controlling survey monument that may be disturbed.

- b) File a Corner Record or Record of Survey with the County Surveyor after setting the survey points to be used for re-establishment of the disturbed controlling survey monuments.
- c) File a Corner Record of Record of Survey with the County Surveyor after re-establishment of the disturbed controlling survey monuments.

2-14.3 Coordination. To the City Supplement, ADD the following:

Other adjacent City project(s) is (are) scheduled for construction for the same time period. See Appendix "F" for approximate location. Coordinate the Work with the adjacent project(s) as listed below:

- a) AC Water Group 1007, PM Sheila Gamueda 619-533-4244
- b) Sewer & AC Water Group Job 834, PM Casey Crown 619-533-5485

SECTION 4 - CONTROL OF MATERIALS

4-1.3.6 Preapproved Materials. To the City Supplement, 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.

4-1.6 Trade Names or Equals. ADD the following:

You must submit your list of proposed substitutions for “an equal” (“or equal”) item(s) **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>

4-1.10 Foreign Materials. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

- 1. Materials that are manufactured, produced, or fabricated outside of the United States shall be delivered to a distribution point in California, unless otherwise specified. Quality Control and related testing shall be performed to all applicable specified US standards. Manufacturer’s testing and staff certification shall be traceable to a United States regulatory agency. Retain the materials for a sufficient period of time to permit inspection, sampling, and testing. You shall not be entitled to an extension of time for acts or events occurring outside of, at point of entry, or during transport to the United States.

SECTION 5 – UTILITIES

5-2 PROTECTION. ADD the following:

1. You shall repair or replace traffic signal and lighting system equipment within 72 hours after notification of defects by the Engineer.
2. While working in or around meter boxes, you shall protect in place all Advanced Metering Infrastructure (AMI) devices attached to the water meter or located in or near water meter boxes, coffins, or vaults **in accordance with the Contract Documents**. This includes any antenna installed through the meter box lid.
 - a) Avoid damaging the antenna, cable, and endpoints when removing the meter box lid and when disconnecting AMI endpoints from the register on top of the water meter.
 - b) If meters or AMI devices need to be removed or relocated, the AMI endpoints shall be reinstalled with the Encoder/Receiver/Transmitter (ERT) pointing upwards.
 - c) Because the AMI equipment is uniquely matched to each service location and to specific meter serial numbers, any AMI devices that are removed or disconnected shall be reinstalled on the same service lateral as well as to the same meter serial number it was attached to originally.
 - d) Do not change or modify the lid if the lid has an antenna drilled through it.
 - e) If you encounter damaged, disconnected, buried, or broken AMI endpoints, cables between the registers, antennae, lids, or ERTs, notify the Engineer within 24 hours.
 - f) Any AMI equipment damaged by you shall be repaired or replaced by City Forces at your expense.

SECTION 6 - PROSECUTION, PROGRESS AND ACCEPTANCE OF WORK

6-7.1 General. To the City Supplement, ADD the following:

5. For Water projects where shutdowns of 16 inch and larger pipes are required, there is a shutdown moratorium from May until October. Contractor shall plan and schedule work accordingly. No additional payment or working days will be granted for delays due to this moratorium.
6. 30 Working days for full depth asphalt final mill and resurfacing work required per SDG-107.

SECTION 7 - RESPONSIBILITIES OF THE CONTRACTOR

7-3 **LIABILITY INSURANCE.** DELETE in its entirety and SUBSTITUTE with the following:

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

7-3.1 **Policies and Procedures.**

1. You must 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 must 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. Payment for insurance is included in the various items of Work as bid by you, and 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 must 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.

7-3.2 **Types of Insurance.**

7-3.2.1 **Commercial General Liability Insurance.**

1. Commercial General Liability Insurance must 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 must 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 must be no endorsement or modification limiting the scope of coverage for either “insured vs. insured” claims or contractual liability. You must maintain the same or equivalent insurance for at least 10 years following completion of the Work.
4. All costs of defense must be outside the policy limits. Policy coverage must 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

7-3.2.2 Commercial Automobile Liability Insurance.

1. You must 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 must be outside the limits of the policy.

7-3.2.3 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.

7-3.2.4

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.

7-3.3 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.

7-3.3.1 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.

7-3.4 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.

7-3.5 Policy Endorsements.

7-3.5.1 Commercial General Liability Insurance.

7-3.5.1.1 Additional Insured.

- a) 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.
- b) 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.
- c) 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.
- d) 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.

7-3.5.1.2 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.

7-3.5.1.3 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.

7-3.5.2 Commercial Automobile Liability Insurance.

7-3.5.2.1 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.

7-3.5.3 Contractors Pollution Liability Insurance Endorsements.

7-3.5.3.1 Additional Insured.

- a) 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.

- b) 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.

7-3.5.3.2 Primary and Non-Contributory Coverage. The policy or policies must 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 must be in excess of your insurance and must not contribute to it.

7-3.5.3.3 Severability of Interest. For Contractors Pollution Liability Insurance, the policy or policies must provide that your insurance must 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 must provide cross-liability coverage.

7-3.5.4 Contractors Hazardous Transporters Pollution Liability Insurance Endorsements.

7-3.5.4.1 Additional Insured.

- 1. The policy or policies must 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.

7-3.5.4.2 Primary and Non-Contributory Coverage. The policy or policies must 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 must be in excess of your insurance and must not contribute to it.

7-3.5.4.3 Severability of Interest. For Contractors Hazardous Transporters Pollution Liability Insurance, the policy or policies must provide that your insurance must 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 must provide cross-liability coverage.

7-3.6 Deductibles and Self-Insured Retentions. You must pay for all deductibles and self-insured retentions. You must disclose deductibles and self-insured retentions to the City at the time the evidence of insurance is provided.

7-3.7 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.

7-3.8 Notice of Changes to Insurance. You must notify the City 30 days prior to any material change to the policies of insurance provided under this contract.

7-3.9 Excess Insurance. Policies providing excess coverage must follow the form of the primary policy or policies e.g., all endorsements.

7-4 WORKERS' COMPENSATION INSURANCE. DELETE in its entirety and SUBSTITUTE with the following:

7-4.1 Workers' Compensation Insurance and Employers Liability Insurance.

1. In accordance with the provisions of §3700 of the California Labor Code, you must 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 must 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

3. By signing and returning the Contract you certify that you are aware of the provisions of §3700 of the Labor Code which require 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 must comply with such provisions before commencing the Work as required by §1861 of the California Labor Code.

7-4.1.1 Waiver of Subrogation. The policy or policies must 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.

7-8.6 Water Pollution Control. ADD the following:

1. Based on a preliminary assessment by the City, the Contract is subject to **WPCP**.

7-10.5.3 Steel Plate Covers. Table 7-10.5.3(A), REVISE the plate thickness for 5'-3" trench width to read 1 3/4".

7-15 INDEMNIFICATION AND HOLD HARMLESS AGREEMENT. To the City Supplement, fourth paragraph, last sentence, DELETE in its entirety and SUBSTITUTE with the following:

Your duty to indemnify and hold harmless does not include any claims or liability arising from the established active or sole negligence, or willful misconduct of the City, its officers, or employees.

7-16 COMMUNITY LIAISON. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

ADD:
7-16 COMMUNITY OUTREACH.

7-16.1 General.

1. To ensure consistency with the City's community outreach plan for the project, the City shall work with you to inform the public (which includes, but shall

not be limited to, property owners, renters, homeowners, business owners, recreational users, and other community members and stakeholders) of construction impacts. Your efforts to mitigate construction impacts by communicating with the public require close coordination and cooperation with the City.

2. You shall perform the community outreach activities required throughout the Contract Time. You shall assign a staff member who shall perform the required community outreach services.
3. You shall closely coordinate the Work with the businesses, institutions, residents, and property owners impacted by the Project.
4. Your example duties include notifying businesses, institutions, and residents of the commencement of construction activities not less than 5 Days in advance, coordinating access for vehicular and pedestrian traffic to businesses, institutions, and residences impacted by the Project, reporting activities at all Project progress meetings scheduled by the Engineer, attending the Project Pre-construction meeting, attending 2 community meetings, responding to community questions and complaints related to your activities, and documenting, in writing, as well as logging in all inquiries and complaints received into the City's internal public contact tracking system.
5. You shall execute the Information Security Policy (ISP) Acknowledgement Form - For Non-City Employees within 15 Days of the award of the Contract if any of the following apply:
 - a) Your contact information is made available on any outreach materials.
 - b) You will be the primary point of contact to resolve project related inquiries and complaints.
6. Electronic Communication.
 - a) All inquiries and complaints shall be logged in to the City's internal public contact tracking system within 24 hours of receipt of inquiries and complaints.
 - b) Any updates or a resolution of inquiries and complaints shall be documented in the City's internal public contact tracking system within 24 hours.
 - c) Copies of email communications shall be saved individually on to the City's internal public contact tracking system in an Outlook Message Format (*.msg).
 - d) All graphics, photos, and other electronic files associated with inquiries and/or complaints shall be saved into the individual records, located within the City's internal public contact tracking system.

7-16.1.1 Quality Assurance.

1. During the course of community outreach, you shall ensure that the character of all persons that conduct community outreach (distributing door hangers, attending community meetings, interacting with the public, etc.) on your behalf shall:

- a. Have the ability to speak and comprehend English and/or Spanish, as appropriate for the community or public they are informing,
- b. Possess and display easily verifiable and readable personal identification that identifies the person as your employee,
- c. Have the interpersonal skills to effectively, professionally, and tactfully represent you, the project, and the City to the public.

7-16.1.2 Submittals.

- 1. You shall submit to the Resident Engineer, for review and approval, all drafts of letters, notices, postcards, door hangers, signs, mailing lists, proposed addresses for hand-delivery, and any other notices and letters that are to be mailed and or distributed to the public.
 - a. Prior to distributing or mailing, you shall submit final drafts of letters, notices, postcards, door hangers, signs, and any other notices and letters to the Resident Engineer for final review and approval. Submit a PDF copy of the approved door hangers to the Engineer.
 - b. After distributing or mailing, you shall submit verification of delivery and any copies of returned notices to the Resident Engineer. Submit a PDF copy of the approved letters and notices to the Engineer.
- 2. You shall use the City’s SDSshare site to identify and summarize communications (via phone, in person, and email) with the public within 24 hours of receipt, even if your response to the individual is still incomplete. You shall upload to the City’s SDSshare site copies of all written, electronic, and verbal communications and conversations with the public.

7-16.2 Community Outreach Services.

7-16.2.1 Public Notice by Contractor.

- 1. Post Project Identification Signs in accordance with 7-10.6.2, “Project Identification Sign”.
- 2. Notify businesses, institutions, property owners, residents or any other impacted stakeholders, within a minimum 300 feet (90 m) radius of the Project, of construction activities and utility service interruptions not less than 5 Days in advance.
- 3. Furnish and distribute public notices in the form of door hangers using the City’s format to all occupants and/or property owners along streets:
 - a. Where Work is to be performed at least 5 Days before starting construction or survey activities or impacting the community as approved by the Resident Engineer.
 - b. Within 5 Days of the completion of your construction activities where Work was performed, you shall distribute public notices in the form

of door hangers, which outlines the anticipated dates of Asphalt Resurfacing or Slurry Seal.

- c. No less than 48 hours in advance and no more than 72 hours in advance of the scheduled resurfacing.
4. Leave the door hanger notices on or at the front door of each dwelling and apartment unit and at each tenant of commercial buildings abutting each of the street block segments. Where the front doors of apartment units are inaccessible, distribute the door hanger notices to the apartment manager or security officer.
5. Door Hanger Material: You shall use Blanks/USA brand, Item Number DHJ5B6WH, 1¼ inch (31.8 mm) Holes (removed), 2-up Jumbo Door Hanger in Bristol White, or approved equal.
6. Mailed Notice Material: You shall use Cougar by Domtar, Item Number 2834, or approved equal.
7. For all Work on private property, contact each owner and occupant individually a minimum of 15 Days prior to the Work. If the Work has been delayed, re-notify owners and occupants of the new Work schedule, as directed by the Resident Engineer.
8. A sample of public notices is included in the Contract Appendix.

7-16.2.2 Communications with the Public.

1. Coordinate access for vehicular and pedestrian traffic to businesses, institutions and residences impacted by the Project.
2. You shall provide updates on construction impacts to the Resident Engineer. You shall notify the Resident Engineer in advance about time-sensitive construction impacts and may be required to distribute construction impact notices to the public on short notice.
3. You shall incorporate community outreach activities related to construction impacts in the baseline schedule and update the Resident Engineer with each week's submittal of the Three-Week Look Ahead Schedule.
4. At the request of the Resident Engineer, you shall attend and participate in project briefings at community meetings.
5. You shall coordinate with the Resident Engineer on all responses and actions taken to address public inquiries and complaints within 24-hours that they are received.

7-16.2.3 Communications with Media.

1. The City may allow members of the media access to its construction site(s) on a case-by-case basis only.
2. Occasionally, members of the media may show up at construction sites, uninvited. Members of the media (including, but not limited to newspaper,

magazine, radio, television, bloggers, and videographers) do not have the legal right to be in the construction site without the City's permission.

3. In the event media representatives arrive near or on the construction site(s), you shall keep them off the site(s), in a courteous and professional manner, until a Public Information Officer is available to meet them at an approved location.
4. You shall report all members of the media visits to the Resident Engineer as quickly as possible, so that the City's Public Information Officer can meet with the members of the media at the construction site(s).
5. If the City allows members of the media to access a construction site, you shall allow the City to escort the media representatives while they are on the construction site and shall ensure their safety.
6. You shall require media representatives to sign in and out of the Site Visitor Log and to use Personal Protective Equipment.
7. You have a right to speak to members of the media about your company and its role on the project. All other questions shall be referred to the City.

7-20

ELECTRONIC COMMUNICATION. ADD the following:

Virtual Project Manager will be used on this contract.

SECTION 9 - MEASUREMENT AND PAYMENT

9-3.2.5

Withholding of Payment. To the City Supplement, item i), DELETE in its entirety and SUBSTITUTE with the following:

- i) Your failure to comply with 7-2.3, "PAYROLL RECORDS" and 2-16, "CONTRACTOR REGISTRATION AND ELECTRONIC REPORTING SYSTEM."

ADD:

9-3.7

Compensation Adjustments for Price Index Fluctuations. To the City Supplement, subsection c), item 2, DELETE in its entirety and SUBSTITUTE with the following:

- 2) In the event of an overrun of Contract time, adjustment in compensation for asphalt binder included in estimates during the overrun period shall be determined using the California Statewide Crude Oil Price Index in effect on the first business day of the month within the pay period in which the overrun began.

ADD the following:

- e) This Contract is not subject to the provisions of The WHITEBOOK for Compensation Adjustments for Price Index Fluctuations for the paving asphalt.

SECTION 203 – BITUMINOUS MATERIALS

203-15 RUBBER POLYMER MODIFIED SLURRY (RPMS). To the City Supplement, CORRECT section numbering as follows:

OLD SECTION NUMBER	TITLE	NEW SECTION NUMBER
203-15	RUBBER POLYMER MODIFIED SLURRY (RPMS)	203-16
203-15.1	General	203-16.1
203-15.2	Materials	203-16.2
203-15.3	Composition and Grading	203-16.3
203-15.4	Mix Design	203-16.4

ADD the following:

RPMS shall be used on this contract.

SECTION 207 – PIPE

207-9.2.3 Fittings. To the City Supplement, ADD the following:

8. Flange gaskets shall be 3.2mm (1/8") thick acrylic or aramid fibers bound with nitrile for all sizes of pipe. Gaskets shall be full-face type with pre-punched holes free of asbestos material. All insulating flange kits require full face gaskets.

207-9.2.6 Polyethylene Encasement for External Corrosion Protection. To the City Supplement, DELETE in its entirety and ADD the following:

1. When soils have been determined to be mildly corrosive through resistivity testing as specified in the City of San Diego Sewer and Water Design Guides, The outside surfaces of ductile iron pipe and fittings for general use shall be coated with bituminous coating 1 mil (25um) thick in accordance with AWWA C151 or AWWA C110. Polyethylene encasement shall be provided in accordance with AWWA C105.

207-17.2.3 Pipe Manufacturer. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

1. PVC products as manufactured or distributed by J-M Manufacturing Company shall not be used on the Contract for pressurized pipe **unless specified otherwise.**

207-26.4 Butterfly Valves. To the City Supplement, Paragraph (2), DELETE the last sentence.

To the City Supplement, Paragraph (3), DELETE in its entirety and SUBSTITUTE with the following:

3. The operator shall be manual with a 2" (50 mm) square operating nut, and shall open the valve when turned counterclockwise.

207-29 FUSIBLE PRESSURE POLYVINYL CHLORIDE PIPE.

207-29.1 General.

1. This subsection specifies fusible polyvinyl chloride pipe for water mains when used for horizontal directional drilling and where shown on the Plans.

207-29.2 Material.

1. Fusible polyvinyl chloride plastic material for pipe shall conform to AWWA C900, AWWA C905, ASTM D2241 or ASTM 1785 for standard dimensions, as applicable. Fusible polyvinyl chloride pipe shall be tested at the extrusion facility for properties required to meet all applicable parameters.
2. Fusible polyvinyl chloride pipe shall be extruded with plain ends. The ends shall be square to the pipe and free of any bevel or chamfer. There shall be no bell or gasket of any kind incorporated into the pipe.
3. Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other deleterious faults.
4. Fusible polyvinyl chloride pipe shall be manufactured in a standard 40' nominal length or custom lengths as specified and DR 18 minimum unless otherwise shown on the plans.

207-29.2.1 Fusible Polyvinyl Chloride Pressure Pipe for Potable Water.

1. Fusible polyvinyl chloride pipe shall be blue in color for potable water use and shall be marked as follows:
 - a) Nominal pipe size
 - b) PVC
 - c) Dimension Ratio, Standard Dimension Ratio, or Schedule.
 - d) AWWA pressure class, or standard pressure rating for non-AWWA pipe, as applicable
 - e) AWWA standard designation number, or pipe type for non-AWWA pipe, as applicable

- f) NSF-61 mark verifying suitability for potable water service
 - g) Extrusion production-record code
 - h) Trademark or trade name
 - i) Cell Classification 12454 and/or PVC material code 1120 may also be included.
2. Pipe shall be homogeneous throughout and be free of visible cracks, holes, foreign material, blisters, or other visible deleterious faults.

207-29.3 Quality Assurance.

- 1. This section contains references to the following documents in the table below. They shall be a part of this section as specified and modified herein.
- 2. Unless otherwise specified, references to documents shall mean the documents in effect at the time of design, bid, or construction, whichever is earliest. If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued.
- 3. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
ANSI/AWWA C110/A21.10	American National Standard for Ductile-Iron and Gray-Iron Fittings, 3-inch through 48-inch, for Water and Other Liquids
ANSI/AWWA C153/A21.53	AWWA Standard for Ductile-Iron Compact Fittings for Water Service
ANSI/AWWA C111/A21.11	American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings

Reference	Title
AWWA C605	Standard for Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water
AWWA C651	Standard for Disinfecting Water Main
AWWA C900	Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4 in. through 12 in. (100mm Through 300mm), for Water Distribution
AWWA C905	Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 14 in. through 48 in. (350mm Through 1200mm), for Water Distribution and Transmission
AWWA M23	AWWA Manual of Supply Practices PVC Pipe—Design and Installation, Second Edition
ASTM D1784	Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
ASTM D1785	Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
ASTM D2152	Test Method for Degree of Fusion of Extruded Poly(Vinyl Chloride) (PVC) Pipe and Molded Fittings by Acetone Immersion
ASTM D2241	Poly (Vinyl Chloride) (PVC) Plastic Pipe (SDR-PR)
ASTM D2665	Poly (Vinyl Chloride) (PVC) Plastic Drain, Waste, and Vent Pipe and Fittings

Reference	Title
ASTM D3034	Standard Specification for Type PSM Poly(Vinyl Chloride) (PVC) Sewer Pipe and Fittings
ASTM F477	Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F1057	Standard Practice for Estimating the Quality of Extruded Poly (Vinyl Chloride) (PVC) Pipe by the Heat Reversion Technique

207-29.4 Submittals. You shall submit the following product data from the pipe supplier or fusion provider.

207-29.4.1 Pre-Construction Submittals.

1. Name of the pipe manufacturer and a list of the materials to be provided by manufacturer. This shall include:
 - a) Pipe Size
 - b) Dimensionality
 - c) Pressure Class per applicable standard
 - d) Color
 - e) Recommended Minimum Bending Radius
 - f) Recommended Maximum Safe Pull Force
 - g) Fusion technician qualification indicating conformance with this specification
2. Written procedural documentation for piping products including proper handling and storage, installation, tapping, and testing.
3. Couplings to be utilized in the installation.

207-29.4.2 Post-Construction Submittals.

1. The following AS-RECORDED DATA is required from the contractor and/or fusion provider to the owner or pipe supplier upon request:
 - a) Pipe Size and Thickness

- b) Machine Size
- c) Fusion Technician Identification
- d) Job Identification
- e) Fusion Joint Number
- f) Fusion, Heating, and Drag Pressure Settings
- g) Heat Plate Temperature
- h) Time Stamp
- i) Heating and Cool Down Time of Fusion
- j) Ambient Temperature

207-29.5 Warranty.

1. The pipe shall be warranted for one year per the pipe supplier's standard terms.
2. In addition to the standard pipe warranty, the fusion services shall be warranted for one year per the fusion service provider's standard terms.

207-29.6 Connections and Fittings for Pressure Applications. The following connections shall be used in conjunction with tie-ins to existing potable water piping as shown on the Plans.

207-29.6.2 PVC Gasketed Push-On Couplings.

Acceptable fittings for use with fusible polyvinyl chloride pipe shall include standard PVC pressure fittings conforming to AWWA C900 or AWWA C905.

1. Acceptable fittings for use joining fusible polyvinyl chloride pipe other sections of fusible polyvinyl chloride pipe or other sections of PVC pipe shall include gasketed PVC, push-on type couplings and fittings, including bends, tees, and couplings as shown in the drawings.
2. Bends, tees and other PVC fittings shall be restrained with the use of thrust blocking or other restraint products as indicated in the construction documents.
3. PVC gasketed, push-on fittings and mechanical restraints, if used, must be installed per the manufacturer's guidelines.

207-29.6.3 Fusible Polyvinyl Chloride Sweeps or Bends.

1. Fusible polyvinyl chloride sweeps or bends shall conform to the same sizing convention, diameter, dimensional tolerances and pressure class of the pipe being joined using the sweep or bend.
2. Fusible polyvinyl chloride sweeps or bends shall be manufactured from the same fusible polyvinyl chloride pipe being used for the installation, and shall have at least 2 feet of straight section on either end of the sweep or bend to allow for fusion of the sweep to the pipe installation. There shall be no gasketed connections utilized with a fusible polyvinyl chloride sweep.
3. Standard fusible polyvinyl chloride sweep or bend angles shall not be greater than 22.5 degrees, and shall be used in nominal diameters ranging from 4 inch through 16 inch.

207-29.6.4 Sleeve -Type Coupling.

1. Sleeve-type mechanical couplings shall be manufactured for use with PVC pressure pipe, and may be restrained or unrestrained as indicated in the construction documents.
2. Sleeve-type couplings shall be rated at the same or greater pressure carrying capacity as the pipe itself.
3. Acceptable sleeve-type mechanical pipe couplings shall be any of those listed on the Water Approved Materials List or approved equal.

207-29.6.5 Expansion and Flexible Coupling.

1. Expansion-type mechanical couplings shall be manufactured for use with PVC pipe, and may be restrained or unrestrained as indicated in the construction documents.
2. Expansion-type mechanical couplings shall be rated at the same or greater pressure carrying capacity as the pipe itself.

207-29.6.6 Connection Hardware. Bolts and nuts for buried service shall be made of non-corrosive, high-strength, low-alloy steel having the characteristics specified in ANSI/AWWA C111/A21.11, regardless of any other protective coating.

207-29.7 Handling and Storage.

1. The pipe shall be handled, stored, and stacked per the manufacturer's and supplier's recommendations, stored at ambient temperatures, and shall be protected from ultraviolet light degradation.
2. Any length of pipe showing a crack or which has received a blow that may have caused an incident fracture, even though no such fracture can be seen,

shall be marked as rejected and removed at once from the Work. Damaged areas or possible areas of damage may be removed by cutting out and removing the suspected incident fracture area. Limits of the acceptable length of pipe shall be determined by Engineer.

3. Any scratch or gouge greater than 10% of the wall thickness shall be considered significant and shall be rejected unless determined otherwise by Engineer.
4. Pipe shall be handled and supported with the use of woven fiber pipe slings or approved equal. Care shall be exercised when handling the pipe to not cut, gouge, scratch, or otherwise abrade the piping in any way.

If pipe is to be stored for periods of 1 year or longer, the pipe shall be shaded or otherwise shielded from direct sunlight. Covering of the pipe that results in temperature build up shall be strictly prohibited. Pipe shall be covered with an opaque material while permitting adequate air circulation above and around the pipe as required to prevent excess heat accumulation.

207-29.7.1 Delivery and Off Loading.

1. All pipes shall be bundled or packaged in such a manner as to provide adequate protection of the ends during transportation to the Site. Any pipe damaged in shipment shall be replaced as directed by Engineer.
2. Inspect each pipe shipment prior to unloading to see if the load has shifted or otherwise been damaged. Notify the Engineer immediately if more than immaterial damage is found. Check for quantity and proper pipe size, color, and type.
3. Pipe shall be loaded, off-loaded, and otherwise handled in accordance with AWWA M23 and all of the pipe supplier's guidelines.
4. Off-loading devices such as chains, wire ropes, chokers, or other pipe handling implements that may scratch, nick, cut, or gouge the pipe are strictly prohibited.
5. During removal and handling, be sure that the pipe does not strike anything. Significant impact could cause damage, particularly during cold weather.
6. If appropriate unloading of equipment is not available, pipe may be unloaded by removing individual pieces. Care should be taken to ensure that the pipe is not dropped or damaged. Pipe should be carefully lowered and not dropped from trucks.

SECTION 209- STREET LIGHTING AND TRAFFIC SIGNAL MATERIALS

209-8.6.1 Ductile Iron Mechanical and Flange Fittings.

1. Acceptable fittings for use with fusible PVC pipe shall include standard ductile iron fittings conforming to AWWA/ANSI C110/A21.10, or AWWA/ANSI C153/A21.53 and AWWA/ANSI C111/A21.11.
 - a) Connections to fusible PVC pipe may be made using a restrained or non-restrained retainer gland product for PVC pipe as well as for mechanical joints or flanged fittings.
 - b) Bends, tees, and other ductile iron fittings shall be restrained with the use of thrust blocking or other means as indicated on the Plans.
 - c) Ductile iron fittings and glands shall be installed per the manufacturer's guidelines.
 - d) If required, linings for ductile iron fittings shall be the following:
 - i. Liquid Epoxy in accordance with AWWA C210.
 - ii. Polyurethane in accordance with AWWA C222.
 - iii. Fusion-Bonded Epoxy in accordance with AWWA C116.
 - e) If required, coatings for ductile iron fittings shall meet the following requirements for buried and/or immersion service duty:
 - i. Liquid Epoxy in accordance with AWWA C210.
 - ii. Polyurethane in accordance with AWWA C222.
 - iii. Fusion-Bonded Epoxy in accordance with AWWA C116.
 - iv. Wax tape coating in accordance with AWWA C217.

SECTION 212 – LANDSCAPE AND IRRIGATION MATERIALS

ADD:

212-3.2.2.3 Trench Marker Tape. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

1. Trench marker tape shall be installed in accordance with Standard Drawing SDM-105, "Warning/Identification Tape Installation".

SECTION 300 – EARTHWORK

300-1.4 **Payment.** To the City Supplement, paragraph (2), DELETE in its entirety and SUBSTITUTE with the following:

2. Payment for existing pavement removal and disposal of up to 12” thick, within the excavation e.g., trench limits, shall be included in the Bid item for installation of the mains or the Work item that requires pavement removal.

SECTION 302 – ROADWAY SURFACING

302-3 **PREPARATORY REPAIR WORK.** To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

302-3 **PREPARATORY REPAIR WORK.**

1. Prior to the placement of asphalt concrete or the application of slurry, you shall complete all necessary preparation and repair Work to the road segment.
2. Unless otherwise specified, preparatory Work shall include tree trimming, weed spray, weed abatement, crack sealing, asphalt repair, mill and pave, hump removal, miscellaneous asphalt patching, removal of raised pavement markers, and removal of pavement markings.
3. You shall repair areas of distressed asphalt concrete pavement by milling or removing damaged areas of pavement to a minimum depth of 2 inches (50.8 mm) for residential streets and a minimum depth of 3 inches (76.2 mm) for all others to expose firm and unyielding pavement.
4. You shall prepare subgrade as needed and install a minimum of 2 inches (50.8 mm) for residential streets and a minimum of 3 inches (76.2 mm) for all other streets of compacted asphalt concrete pavement over compacted native material as directed by the Engineer.
5. If the base material is exposed in order to achieve the minimum specified depth, the material shall be compacted to 95% relative compaction (dig out). Compaction tests shall be made to ensure compliance with the specifications.
6. The Engineer shall determine when and where the test shall occur. The City will pay for the soils testing required by the Engineer which meets the required compaction. You shall reimburse the City for the cost of retesting failing compaction tests. If additional base material is required, you shall use Class 2 Aggregate Base in accordance with 200-2.2, “CRUSHED AGGREGATE BASE”.
7. Recycled base material shall conform to crushed miscellaneous base material in accordance with 200-2.4, “CRUSHED MISCELLANEOUS BASE”.

8. Prior to replacing asphalt, the area shall be cleaned by removing all loose and damaged material, moisture, dirt, and other foreign matter and shall be tack coated in accordance with 302-5.4, "TACK COAT".
9. You shall install new asphalt within the repair area or for patches in accordance with 302-5, "ASPHALT CONCRETE PAVEMENT". Asphalt concrete shall be C2-PG 64-10 in compliance with 400-4, "ASPHALT CONCRETE".
10. No preparatory asphalt Work shall be done when the atmospheric temperature is below 50° F (10° C) or during unsuitable weather.
11. Following the asphalt placement, you shall roll the entire area of new asphalt in both directions at least twice. The finished patch shall be level and smooth in compliance with 302-5.6.2, "DENSITY AND SMOOTHNESS". After placement and compaction of the asphalt patch, you shall seal all finished edges with a 4 inch (101.6 mm) wide continuous band of SS-1H.
12. The minimum dimensions for each individual repair shall be 4 feet by 4 feet (1.2 m by 1.2 m) and shall be subject to the following conditions:
 - a) If the base material is exposed to achieve the required minimum removal thickness, the base material shall be prepared conforming to 301-1, "SUBGRADE PREPARATION".
 - b) When additional base material is required, then you shall use Class 2 Aggregate Base in accordance with 200-2.2, "CRUSHED AGGREGATE BASE". Recycled base material shall conform to crushed miscellaneous aggregate base material in accordance with 200-2.4, "CRUSHED MISCELLANEOUS BASE".
 - c) You may use grinding as a method for removal of deteriorated pavement when the areas indicated for removal are large enough (a minimum of the machine drum width) and when approved by the Engineer.
 - d) For both scheduled and unscheduled base repairs, failed areas may be removed by milling or by excavation provided that the edges are cut cleanly with a saw. The areas shall be cleaned and tack coated in accordance with 302-5.4, "TACK COAT" before replacing the asphalt. The areas for scheduled repairs have been marked on the street.
 - e) Base Repairs with RAC. Areas where failed paving is removed either by cold milling or by excavation shall be restored to existing pavement grade with ¾ inch (19.1 mm) RAC at 8 inch (203.2 mm) depth unless otherwise directed by the Engineer. These areas have been marked on the street as "DO". The asphalt concrete shall be B3-PG 64-10 as specified in 400-4, "ASPHALT CONCRETE". Preliminary quantities are identified in the Contract Appendix but may need to be increased and approved by the Engineer at the time of construction. Base repairs shall not exceed 15% RAP in content.

- f) **Unscheduled Base Repair with RAC.** If paving operations cause damage outside of your control and require additional base repair, the areas shall be removed either by cold milling or by excavation and shall be restored to existing pavement grade with $\frac{3}{4}$ inch (19.1 mm) RAC at 8 inch (203.2 mm) depth unless otherwise directed by the Engineer. The asphalt concrete shall be B3-PG 64-10 as specified in 400-4, "Asphalt Concrete". Unscheduled base repairs shall not exceed 15% RAP.
- g) A base repair is considered unscheduled when it is not identified on the pavement with a "DO" or when you are directed by the Engineer to perform a base repair for the proper placement of an asphalt overlay.

302-3.1

Asphalt Patching.

1. Asphalt patching shall consist of patching potholes, gutter-line erosions, and other low spots in the pavement that are deeper than $\frac{1}{2}$ inch (12.7 mm) in accordance with 302-5.6.2, "DENSITY AND SMOOTHNESS".
2. The areas requiring patching have been identified in the Contract Documents, marked on the streets, or as directed by the Engineer. You shall identify any new areas that may require patching prior to slurry Work to ensure the smoothness and quality of the finished product.
3. You shall identify and repair any areas that may require patching prior to the placement of slurry seal for a smooth and finished product.
4. Asphalt overlay shall not be applied over deteriorating pavement. Preparatory asphalt Work shall be completed and approved by the Engineer before proceeding with asphalt overlay.
5. You shall remove distressed asphalt pavement either by saw cutting or milling to expose firm and unyielding pavement, prepare subgrade (as needed), and install compacted asphalt concrete pavement over compacted native material as directed by the Engineer.
6. Prior to replacing asphalt, the area shall be cleaned and tack coated in accordance with 302-5.4, "TACK COAT".
7. Following the asphalt placement, you shall roll the entire patch in both directions and shall cover the patch at least twice.
8. After placement and compaction of the asphalt patch, you shall seal all finished edges with a 4 inch (101.6 mm) wide continuous band of SS-1H.
9. Base repairs shall not exceed 15% RAP in content.

302-3.2

Payment.

1. The payment for the replacement of existing pavement when required shall be included in the Contract Unit Price for “ASPHALT PAVEMENT REPAIR” for the total area replaced and no additional payment shall be made regardless of the number and size of replacements completed. No payment shall be made for areas of over-excavation or outside trench areas in utility Works unless previously approved by the Engineer. No payment for pavement replacement will be made when the damage is due to your failure to protect existing improvements. You shall reimburse the City for the cost of retesting all failing compaction tests.
2. The areas and quantities shown on the road segments and in the appendices are given only for your aid in planning the Work and preparing Bids. The Engineer will designate the limits to be removed and these designated areas shall be considered to take precedence over the area shown in an Appendix to the Contract Documents. The quantities shown in the appendices are based on a street assessment survey and may vary.
3. At the end of each day, you shall submit to the Engineer an itemized list of the asphalt pavement repair Work completed. The list shall include the location of the Work and the exact square footage of the repair.
4. The payment for preparatory repair Work and tack coating shall be paid at the Contract Unit Price for “ASPHALT PAVEMENT REPAIR”.
5. The payment for milling shall be included in the Bid item for “ASPHALT PAVEMENT REPAIR” unless Bid items for asphalt milling Work has been provided.
6. The payment for miscellaneous asphalt patching shall be included in the Contract Unit Price for the slurry Work and no additional payment shall be made, unless a Bid item for “MISCELLANEOUS ASPHALT PATCHING” has been provided.

302-5.1.1 Damaged AC Pavement Replacement. To the City Supplement, DELETE in its entirety.

302-5.1.2 Measurement and Payment. To the City Supplement, DELETE in its entirety.

302-5.2.1 Measurement and Payment. To the City Supplement, item c), ADD the following:

Imported Subgrade material shall be paid per bid item “IMPORTED BACKFILL”.

SECTION 306 – UNDERGROUND CONDUIT CONSTRUCTION

306-1 **OPEN TRENCH OPERATIONS.** To the City Supplement, CORRECT certain section numbering as follows:

OLD SECTION NUMBER	TITLE	NEW SECTION NUMBER
306-1.8	House Connection Sewer (Laterals) and Cleanouts	306-1.9
306-1.7.1	Payment	306-1.9.1
306-1.7.2	Sewer Lateral with Private Replumbing	306-1.9.2
306-1.7.2.1	Location	306-1.9.2.1
306-1.7.2.2	Permits	306-1.9.2.2
306-1.7.2.3	Submittals	306-1.9.2.3
306-1.7.2.4	Trenchless Construction	306-1.9.2.4
306-1.7.2.5	Payment	306-1.9.2.5
306-1.7.3.6	Private Pump Installation	306-1.9.2.6
306-1.7.3.7	Payment	306-1.9.2.7

306-1.1.1 **General.** ADD the following:

Build the Project in accordance with the water high lining phasing shown on the Plans and in phases as follows:

1. Phase I: Rosemont Street
2. Phase II: Soledad Ave., Hillside Dr., and Castellana Rd.

306-1.4.5 **Water Pressure Test.** To the City Supplement, Paragraph (2), DELETE in its entirety and SUBSTITUTE with the following:

2. Pressure testing of pipe and fittings at the lowest elevation shall be performed at 150% of the specified test pressure and no less than 100% of the specified test pressure at the highest elevation.

Specified test pressure for Class 235 pipe will be 150 psi

Specified test pressure for Class 305 pipe will be 200 psi

306-1.6 **Basis of Payment for Open Trench Installations.** To the City Supplement, ADD the following:

8. The payment for imported backfill when you elect to import material from a source outside the project limits and when authorized by the Engineer shall be included in the Bid item for "Imported Backfill". The price shall include the removal and disposal of unsuitable materials.

306-1.8.3 **Polyurethane Lining.** To the City Supplement, item 5, DELETE in its entirety.

306-20.8 **Carrier Pipe.** To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

Carrier pipe materials shall be approved by the Engineer. The Contractor shall use only HDPE. The Contractor shall furnish and install a structurally sound, leak-proof, fusible high density polyethylene pipe, for all piping identified for installation by horizontal directional drilling. The Contractor shall be responsible for the sizing of the carrier pipe to withstand all installation forces, curvature, and residual forces and final in place loading. The selected material shall have an inside diameter no less than stated on the drawings. Individual pipe lengths shall be assembled by butt-fusion unless otherwise specified.

ADD:

306-23 **PRESSURE REGULATING STATION (PRS).**

Pressure Reducing Station shall include pre-cast concrete vault, vault hatch, pressure reducing valves per Section 306-23.1 as shown in Sheet 12 and Sheet 13, all piping, valves and appurtenances as shown in Sheet 13 of the Construction plans for the Pressure Reducing Station.

The initial settings for the pressure reducing valves are shown below. The Contractor shall coordinate the final settings with the City Water Operations staff.

STATION	UPSTREAM HGL	DOWNSTREAM HGL
La Jolla Hermosa/North City	610	370

306-23.1 **Pressure Reducing Valves.** You shall provide pressure regulating valves indicated, complete and operable, with all accessories. You shall furnish submittals in accordance with 2-5.3. Pressure regulating valves shall be installed in accordance with the manufacturer's written instructions.

1. **WATER PRESSURE REDUCING VALVES (LARGER THAN 1-1/2 INCHES)**
 - a. General: Large water pressure regulating valves shall be of the piston-type or diaphragm- actuated globe type, with cast iron body stainless

steel trim. Unless otherwise indicated, the valves shall have a pressure rating of not less than 250 psi, shall have 250-lb flanges, and shall have an adjustable downstream pressure range with downstream setting as required.

- b. Pressure reducing valves shall be provided with the following additional equipment by manufacturer:
 - 1. Valve position indicator kit
 - 2. Pressure differential transmitter flow monitoring kit.
- c. Manufacturers or Approved Equal:
 - 1. Cla-Val Company
 - 2. Golden-Anderson Valve Division (G A Industries, Inc.)
 - 3. Watts Regulator Company

306-23.2 **Payment.** The Lump Sum price of the Pressure Reducing Station shall include full compensation for all materials and labor needed to complete installation per the Specifications, Standard Drawings and Construction Plans and no additional payment will be allowed therefore. The Lump Sum price of the Removal of Existing Pressure Reducing Station shall include full compensation for all materials and labor needed to complete the work.

ADD:

306-24 **INSTRUMENTATION AND CONTROLS (I&C) – Soledad Avenue.** The I&C portion of the PRS shall include, but not limited to, installation of pressure transmitters and appurtenances, pole mounted remote control panel and pressure transmitter panels, electrical service from existing light pole to pole mounted panels, limit proximity switch on pre-cast vault hatch, control wiring between the field instrument described and location of the control panels. In addition, the pressure reducing valve is to be provided with optional electronic position indication and flow monitoring kits that will be installed to be integrated with the subject remote control panel. The I&C will require specialty services that include the complete installation and start up of the subject equipment in accordance with the Specifications, and Construction Plans. See TECHNICALS. Instrumentation and Controls for technical specifications of SCADA system for the Soledad Avenue Street Pressure Reducing Station (PRS).

306-24.1 **Payment.** The Lump Sum price of the Instrumentation and Controls for pressure regulating station shall be full compensation for all material, equipment and labor needed to complete the installation at no additional cost to the City. The lump sum price shall also include the testing of Instrumentation and Controls and coordination with City Personnel for the operational check.

ADD:

SECTION 312 - PIPE FUSION FOR WATER MAINS

312-1 FUSION TECHNICIAN REQUIREMENTS.

1. Fusible Pressure PVC Pipe shall be butt-fused by qualified fusion technicians, as certified by the pipe supplier. Training records for qualified fusion technicians shall be available to the Engineer upon request. The fusion technician shall be fully qualified by the pipe supplier to install fusible Pressure PVC pipe of the type(s) and size(s) being used.

312-2 FUSION PROCESS.

1. Fusible pipe shall be handled in a safe and non-destructive manner before, during, and after the fusion process and in accordance with these specifications and pipe supplier's recommendations.
2. Fusible PVC pipe shall be butt-fused by qualified fusion technicians, as certified by the pipe supplier.
3. Each fusion joint shall be recorded and logged by an electronic monitoring device (data logger) connected to the fusion machine.
4. The fusible pipe shall be installed without exceeding the recommended bending radius.
5. Where fusible pipe is installed by pulling in tension, the recommended safe pulling force, according to the pipe supplier, shall not be exceeded.
6. Only appropriately sized and outfitted fusion machines that have been approved by the pipe supplier shall be used for the fusion process.
7. Fusion machines shall incorporate the following properties and elements:
 - a) **HEAT PLATE** – Heat plates shall be in good condition with no deep gouges or scratches within the pipe circle being fused. Plates shall be clean and free of any contamination. Heater controls shall properly function and cords and plugs shall be in good condition. The appropriately sized heat plate shall be capable of maintaining a uniform and consistent heat profile and temperature for the size of pipe being fused per the pipe supplier's recommendations.
 - b) **CARRIAGE** – Carriage shall travel smoothly with no binding at less than 50 psi. Jaws shall be in good condition with proper inserts for the pipe size being fused. Insert pins shall be installed with no interference to carriage travel.
 - c) **GENERAL MACHINE** – Overview of machine body shall yield no obvious defects, missing parts, or potential safety issues during fusion.
 - d) **DATALOGGER** – The current version of the pipe supplier's recommended and compatible software shall be used. Protective cases shall be utilized for the hand held wireless portion of the unit. Datalogger operations and maintenance manual shall be with the unit at all times. If fusing for extended periods of time, an independent 110 V power source shall be available to extend battery life.

8. Other equipment specifically required for the fusion process shall include the following:
 - a) Pipe rollers shall be used for support of pipe to either side of the machine.
 - b) A weather protection canopy that allows full machine motion of the heat plate, fusion assembly, and carriage shall be provided for fusion in inclement and /or windy weather.
 - c) An infrared (IR) pyrometer for checking pipe and heat plate temperatures.
 - d) Fusion machine operations and maintenance manual shall be kept with the fusion machine at all times.
 - e) Facing blades specifically designed for cutting fusible PVC pipe.
9. Each fusion joint shall be recorded and logged by an electronic monitoring device (Datalogger) connected to the fusion machine. The fusion data logging and joint report shall be generated by software developed specifically for the fusion of fusible PVC pipe. The software shall include fusible HDPE pipe based dimensional data and fusible PVC pipe based interfacial pressure relationships. Data not logged by the Datalogger shall be logged manually and be included in the Fusion Technician's joint report.

312-3

FUSION JOINTS.

1. Unless otherwise specified, fusible pressure PVC pipe lengths shall be assembled in the field with butt-fused joints. You shall follow the pipe supplier's written instructions for this procedure. Joint strength shall be equal to the pipe as demonstrated by testing requirements. Fusion joints shall be completed as described in these specifications.
2. All external beads shall be removed prior to installation in accordance with the manufacturer's recommendation. The final pipe surfaces shall be smooth after bead removal. Internal beads need not be removed. Joints shall be made available for inspection by the Engineer before insertion.
3. PVC gasketed and push-on fittings and retainer glands shall be installed per the manufacturer's recommendations.

312-4

PIPE INSTALLATION.

1. The pipe, including the ends and joints, shall be protected against damage. Any pipe damaged during installation shall be replaced by you. Pipe shall be fused prior to insertion. Replacement pipe with gashes, nicks, abrasions, or any such physical damage which may have occurred during storage or handling shall not be used and shall be removed from the Site. You shall exercise care in handling the pipe and shall not drag the pipe on pavement.
2. During installation, comply with the following:
 1. Installation guidelines from the pipe supplier shall be followed for all installations.

2. The fusible PVC pipe shall be installed in a manner so as not to exceed the recommended bending radius.
3. Where fusible PVC pipe is installed by pulling in tension, the recommended safe pulling force established by the pipe supplier shall not be exceeded.

312-5 PIPE PULL-BACK AND INSERTION.

1. You shall handle the pipe in a manner that will not over-stress the pipe prior to insertion. Vertical and horizontal curves shall be limited so that the pipe does not over-deflect, buckle, or otherwise become damaged. Damaged portions of the pipe shall be removed and replaced.
2. The pipe entry area shall be graded if needed to provide support for the pipe and to allow free movement into the bore hole. The pipe shall be guided into the bore hole to avoid deformation of or damage to the pipe.
3. The fusible pipe may be continuously or partially supported on rollers or other Engineer approved friction decreasing implement during joining and insertion, if the pipe is not over-stressed or critically abraded prior to or during installation.
4. Buoyancy modification shall be at your sole discretion and shall not exceed the pipe supplier's recommendations. Damage caused by buoyancy modifications shall be your responsibility.
5. Once pull-back operations have commenced, the operation shall continue without interruption until the pipe is completely pulled through the bore hole. Except for drill rod removal, pull-back operations shall not cease until the pipe has been completely installed to final position. During the pull-back operations, excessive pull-back force shall be reported to the Engineer.

312-6 PREPARATION PRIOR TO CONNECTIONS TO EXISTING PIPE SYSTEM.

1. Approximate locations of existing piping systems are shown on the Plans. Prior to making connections into existing piping systems, you shall:
 - a) Field verify locations, sizes, piping materials, and piping systems of the existing pipe.
 - b) Obtain all required fittings, which may include saddles, sleeve type couplings, flanges, tees, or others as shown on the Plans.
 - c) Have installed all temporary pumps and/or pipes.
2. Unless otherwise approved, new piping systems shall be completely installed and successfully tested prior to making connections into existing pipe systems.

312-7 PIPE SYSTEM CONNECTIONS.

1. Pipe connections shall be installed per the applicable standards (207-29.3, Quality Assurance) and regulations as well as per the connection

manufacturer's guidelines and as indicated on the Plans. Pipe connections to structures shall be installed per applicable standards and regulations as well as per the connection manufacturer's guidelines.

312-8 TAPPING FOR POTABLE AND NON-POTABLE WATER.

1. Tapping shall be performed using standard tapping saddles designed for use on PVC piping in accordance with AWWA C605. Tapping shall be performed only with use of tap saddles or sleeves. Direct tapping shall not be permitted. Tapping shall be performed in accordance with the applicable sections for saddle tapping per Uni-Pub-8.
2. All connections requiring a larger diameter than that recommended by the pipe supplier shall be made with a pipe connection as specified and indicated on the Drawings.
3. Equipment used for tapping shall be made specifically for tapping PVC pipe.
 - a) Tapping bits shall be slotted "shell" style cutters specifically made for PVC pipe. "Hole saws" made for cutting wood, steel, ductile iron, or other materials shall be strictly prohibited.
 - b) Manually operated or power operated drilling machines may be used.
 - c) Taps may be performed while the pipeline is filled with water and under pressure (wet tap) or when the pipeline is not filled with water and not under pressure (dry tap).

312-9 HYDROSTATIC TEST FOR PRESSURE PIPE.

1. Testing shall comply with 306-1.4.5, "Water Pressure Test" and all applicable jurisdictional building codes, statutes, standards, regulations, and laws.
 1. Hydrostatic and leakage testing for piping systems that contain mechanical jointing as well as fused PVC jointing shall comply with AWWA C605.
 2. A simultaneous hydrostatic and leakage test following installation with a pressure equal to 150% of the working pressure at point of test but not less than 100% of the normal working pressure at highest elevation shall be applied, unless otherwise approved by the engineer. The duration of the pressure test shall be for 2 hours.
 3. If hydrostatic testing and leakage testing are performed at separate times, follow procedures as outlined in AWWA C605.
 4. In preparation for pressure testing, the following parameters shall be followed:
 - a) All air shall be vented from the pipeline prior to pressurization. This may be accomplished with the use of the air relief valves

or corporation stop valves, vent piping in the testing hardware or end caps, or any other method which adequately allows air to escape the pipeline at all high points. Venting may also be accomplished by “flushing” the pipeline in accordance with the parameters and procedures as described in AWWA C605.

312-10 DISINFECTION OF THE POTABLE WATER PIPE.

1. After installation and after passing all required testing, the pipeline shall be disinfected prior to being put into service.
2. Unless otherwise directed by the Engineer, the pipeline shall be disinfected in accordance with 306-1.4.7, “Disinfection and Testing” and in accordance with AWWA C651.

312-11 GROUND MONITORING.

1. See 306-20.9, “Ground Monitoring”.

312-12 PAYMENT.

1. The payment for pipe fusion Work shall be included in the linear foot Bid item for Water Main Fusible.
2. The payment for water service connections associated with fusible pressure PVC Pipe shall be included in the Work of the Water Main Fusible.

SECTION 500 – PIPELINE

500-1.1.1 General. To the City Supplement, (1) (a), ADD the following:

The felt and resin system shall be selected from those listed in the City’s approved material list.

500-1.1.2.1 Initial Submittals. To the City Supplement, ADD the following:

Within 5 Working Days of the Bid opening date, the three apparent low bidders shall submit the following:

- Contractor’s Experience; past project documentation
- Manufacturer Certification
- Authorize Installer Certificates

500-1.1.5 Video Inspection. To the City Supplement, ADD the following:

During the post-cleaning video you shall identify all existing protruding laterals within the existing main and trim them flush to the main prior to rehabilitation. The cost of trimming the existing laterals shall be included in the pipe rehabilitation bid item.

500-1.1.9 Measurement and Payment. To the City Supplement, item 3, DELETE in its entirety.

500-1.2.4 Sewer Bypassing and Dewatering. DELETE in its entirety and SUBSTITUTE with the following:

When required by the Contract Documents, the Contractor shall bypass the sewer flow around the Work and dewater the Site in conformance with 704, "SEWAGE SPILL PREVENTION" and 705-2.1, "General."

500-1.6 Service Laterals. To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

ADD:

500-1.6 Service Lateral Rehabilitation.

500-1.6.1 General.

1. The rehabilitation shall be accomplished using a fabric or fiberglass tube of particular length and a thermoset resin with physical and chemical properties appropriate for the application without excavation and disturbing surface improvements. The tube is vacuum impregnated with the resin. Access to an upstream end of the service lateral is made by excavation in the public right of way. Installation of the resin-impregnated tube into the service lateral may be performed either by Type A inversion in accordance with ASTM F1216 or by Type B pull-in in accordance with ASTM F 1743 and may be performed from either the mainline or the excavated end of the lateral.
2. The cured-in-place liner shall extend the entire length of the lateral from the access point to the mainline. Once the tube or resin composite is cured, the installation equipment shall be removed and the protruding end in the collector shall be cut using a robotic cutting device. A sewer cleanout in accordance with the Standard Drawing SDS-102, "Sewer Lateral Cleanout (In Driveway, Paved Alley, Sidewalk, or Other Area Subject to Traffic)" or SDS-103, "Sewer Lateral Cleanout Outside Traveled Way" shall be installed at the access point and properly backfilled.
3. A lateral rehabilitation including the installation of lateral cleanout and backfill process shall be completed within 15 Working Days.
4. The liner shall be extended sufficiently to create a water tight seal at the main and the liner interface.
5. If there is a SLC in place, then the cured-in-place lateral liner shall have a minimum overlap of 2 inches over the previously installed SLC sewer main.
6. Existing ABS and PVC sewer laterals shall not be rehabilitated. These laterals shall be replaced or shall have point repairs performed on them as directed by the Engineer.

500-1.6.2 Material.

1. The tube shall consist of one or more layers of flexible needled felt, or an equivalent material. Where the tube is fabricated from non woven felt, the longitudinal and circumferential joints are made up by seal bonding. The tube shall be capable of conforming to bends, off-set joints, bells, and disfigured pipe sections. The resin and catalyst system as designed for the specific application shall meet the chemical resistance requirements of 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)."
2. The composite of the materials above shall, upon installation inside the host pipe, shall exceed the minimum test standards specified in Table 500-1.4.2 (A).
3. The thickness of the lateral lining shall be not less than 0.12 inches (3 mm) and not more than 0.18 inches (4.5 mm) for laterals up to and including 8 inches in diameter. The thickness of the lateral lining shall be in accordance with Table 500-1.1.1.1 (A) for laterals larger than 8" in diameter.

500-1.6.3 Installation Procedures (ASTM F1216-98 and ASTM F1743).

1. The property owner of the lateral being reconstructed shall be informed and the flow stopped for the period of reconstruction Work.
2. You shall excavate an access pit at the property line cleanout or at an approved upstream point on the service lateral in accordance with the reconstruction length determined by the Engineer.
3. You shall clean, video, and determine the structural condition of the lateral line prior to installation. Roots, debris, and protruding service connections shall be removed prior to installation.
4. The tube shall be inspected for torn or frayed sections. The tube in good condition shall then be vacuum impregnated with the thermoset resin.
5. No open pans or uncontrolled open-air pouring of resin shall be allowed during tube saturation. Resin shall be contained within the inflation bladder during vacuum impregnation and insertion. You shall ensure that no property is exposed to contamination by liquid resin compounds or components.
6. The saturated tube along with the inflation bladder shall be inserted into the installation equipment and the end closed. The entire installation equipment shall be placed in the pipe access pit and aligned with the exposed end of the pipe.
7. The resin and tube shall be completely protected during the placement. The resin shall not be contaminated or diluted by exposure to dirt, debris, or water during the placement.
8. The tube shall be installed from the installation equipment by controlled air, water, or steam pressure in accordance with manufacturer instructions. The tube shall extend the entire reconstruction length and shall be held tightly in place against the wall of the host pipe until the cure is complete.

9. When the curing process is complete, the pressure is released and the inflation bladder reverted back into the installation equipment and removed from the access point.
10. No barriers, coatings, or any material other than the cured tube or resin composite specifically designed for desirable physical and chemical resistance properties shall be left in the host pipe. Any materials used in the installation other than the cured tube or resin composite shall be removed.
11. Any cured tube or resin composite pipe left protruding from the service connection shall be trimmed back using a hydraulic-powered robotic cutting device specifically designed for cutting cured-in-place pipe made from these materials.
12. A second video inspection shall be performed to verify the proper cure of the material, the proper trim of service connection, and the integrity of the seamless pipe.
13. The bypass pumping system shall be removed and the sewer flows restored to normal flow conditions. The service lateral pipes shall be coupled together. The excavation shall be properly backfilled. The property owner of the service connection shall be informed when the Work is complete.

500-1.6.4 **Deviations.** If pre-installation inspection reveals conditions in the service lateral to be substantially different than those used in the design of wall thickness, tube construction, tube length, or resin system; then the Contractor shall correct the situation as approved by the Engineer.

500-1.6.5 **Acceptance.** Upon completion, the Contractor shall deliver the video records and written reports to the Engineer. The Engineer shall review the documentation and the Site to determine if the Work is complete and the work may be accepted.

500-1.6.6 **Payment.**

1. The payment for the Service Lateral Rehabilitation covered under 500-1.6, "Service Laterals Rehabilitation" shall be made per each lateral and shall include all necessary labor, material and equipment to clean, repair, and line the Sewer Lateral.
2. The payment for the installation of a sewer cleanout at the access point shall be included in the following Bid items:

Service Lateral Rehabilitation with Cleanout up to 7 Feet in Depth
Service Lateral Rehabilitation with Cleanout Greater than 7 Feet in Depth

3. The payment for point repairs shall be paid for in accordance with 500-1.2.7, "Payment".
4. The payment for cleaning and video inspection for rehabilitated laterals shall be in accordance with 306-18.7, "Payment".

500-1.7.10 Payment. To the City Supplement, DELETE in its entirety.

500-1.10.7 Payment. To the City Supplement, DELETE in its entirety.

500-1.13.10 Payment. To the City Supplement, DELETE in its entirety.

500-4 SERVICE LATERAL CONNECTION SEALING. DELETE in its entirety and SUBSTITUTE with the following:

500-4 SERVICE LATERAL CONNECTION (SLC) SEALING.

500-4.1 General.

1. SLC is the interface of the house sewer lateral with the main sewer. SLC to rehabilitated sanitary sewer lines shall be sealed, normally without excavation, by the installation of a resin-impregnated, flexible, felt tube or fiberglass tube installed into the existing service lateral. The tube shall form a “tee” section with a full lap inside the main pipe and shall extend continuously from the sewer main into the lateral for a minimum of 4”. SLC may be a combination of “tees” or “wyes” of varying angle. The resin shall be cured to form the tube into a hard impermeable pipe-within-a-pipe. When cured, the SLC shall seal the connection of the lateral to the mainline in a continuous tight-fitting, watertight pipe-within-a-pipe to eliminate any visible leakage between the lateral and mainline and shall provide a leak-proof seal designed for a minimum 50-year life to prevent root intrusion, infiltration, and exfiltration between a liner and a host pipe.
2. Prior to cleaning and pre-rehab video inspection, the Contractor shall submit a detailed operational plan for the proposed cleaning of all roots inside the pipe and around the service connection for the Engineer’s approval. After cleaning, the Contractor shall proceed with lining of the pipe and reinstating all live service connections. The service connection openings shall conform to the shape and the size of the inside diameter of the existing service connection. Contractor shall use a wire brush or other methods and equipment as recommended by other lining system providers, or other approved means and methods to provide a smooth opening for connecting the lateral to the newly lined pipeline.
3. The Contractor shall trim all protruding laterals which interfere with the lining installation, as flush with the pipe interior as practicable.

500-4.2 Reference Specification. This specification references ASTM test methods which are made a part hereof by such reference and shall be the latest edition and revision thereof and shall meet the chemical resistance requirements of section 210-2.3.3, “Chemical Resistance Test (Pickle Jar Test).”

500-4.3.1 General Corrosion Requirements.

1. The finished SLC product shall be fabricated from materials which when cured shall be chemically resistant to withstand internal exposure

to domestic sewage and shall meet the chemical resistance requirements of 210-2.3.3, "Chemical Resistance Test (Pickle Jar Test)" and Table 210-2.4.1 (A).

2. The SLC product shall be compatible with the lining system materials utilized in the main sewer line.

500.4-4 SLC Materials.

1. A flexible, felt tube shall be fabricated to neatly fit the internal circumference of the conduit specified by the City. Allowance shall be made for circumferential stretching during insertion.
2. The SLC sealing shall extend a minimum of 4 inches from the mainline into the lateral.
3. You shall furnish a specially designed, unsaturated polyester or vinyl ester resin and catalyst system compatible with the SLC sealing process that provides cured physical strengths specified herein.

500-4.5 Physical Properties.

1. The cured SLC sealing shall conform to the minimum structural standards as listed in Table 500-1.4.2 (A).
2. No cured-in-place pipe rehabilitation technology shall be allowed that requires bonding to the existing pipe for any part of its structural strength.
3. Design methods are to be derived for various loading parameters and modes of failure. Equations shall be modified to include deformation in the shape of an oval as a design parameter. The design method shall be submitted to the Engineer for approval prior to the Pre-construction Meeting.

500-4.6 Installation Preparation.

1. You shall remove internal debris out of the sewer line.
2. Inspection of pipelines shall be performed by experienced personnel trained in locating breaks and obstacles by closed circuit television. The interior of the pipeline shall be carefully inspected to determine the location of any conditions which may prevent proper installation of the SLC sealing into the pipelines and it shall be noted so that these conditions can be corrected. A color video and suitable log shall be kept for later reference by the City.
3. When required, provide for the flow of sewage around the section or sections of mainline pipe where the service lateral designated for SLC sealing is located. The bypass shall be made by plugging the line at an existing upstream manhole and pumping the flow into a downstream manhole or adjacent system. The pump and bypass lines shall be of adequate capacity and size to handle the flow without service interruption. The bypass systems shall be approved in advance by the City.
4. The service lateral shall be inactive during the time of installation.

5. You shall clear the line of obstructions that prevent the insertion of the SLC sealing material. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, you shall make an external point repair excavation to uncover and remove the obstruction. You shall inform the Engineer prior to the commencement of the Work.
6. The mainline pipe opening shall be prepared to accept the SLC sealing and the mainline rehabilitated pipe shall be maximized to obtain the best possible connection.
7. The transition from the mainline pipe to the service lateral shall be smooth and continuous to provide adequate support for the SLC sealing during installation and cure.

500-4.7 SLC Sealing Installation.

1. The resin impregnated tube shall be loaded inside a pressure apparatus. The pressure apparatus, attached to a robotic device, shall be positioned in the mainline pipe at the service connection. The robotic device, together with a television camera, shall be used to align the SLC repair with the service connection opening. Air pressure, supplied to the pressure apparatus through an air hose, shall be used to invert the resin impregnated SLC sealing into the lateral pipe. The inversion pressure shall be adjusted to fully invert the SLC sealing into the lateral pipe and hold the tube tight to the pipe wall. Care shall be taken during the curing process not to over-stress the tube.
2. The pressure apparatus shall include a bladder which shall inflate in the mainline pipe, effectively seating the SLC repair against the service connection.
3. After inversion or pull-in is completed, the recommended pressure shall be maintained on the impregnated tube for the duration of the curing process. Curing method shall be compatible with the resin selected. An ultraviolet (UV) light cured, heat cured, or ambient cured resin system is typically used.
4. The initial cure shall be deemed to be completed when the SLC sealing has been exposed to the UV light or heat source or held in place for the time period specified by the manufacturer.
5. You shall cool the hardened SLC sealing before relieving the pressure in the pressure apparatus. Cool-down may be accomplished by the introduction of cool air into the pressure apparatus. Care shall be taken to maintain proper pressure throughout the cure and cool-down period.
6. The finished SLC shall be free of dry spots, lifts, and delamination. The lateral SLC shall not inhibit the final video of the mainline or service lateral pipes. Frayed ends of the SLC repair shall be removed prior to acceptance.
7. During the warranty period, any defects which shall affect the integrity of strength of the SLC shall be repaired at your expense in a manner mutually agreed upon by the manufacturer, City, and you.
8. After the Work is completed, you shall provide the City with a video recording showing the completed Work including the restored conditions.

500-4.8 **Clean-Up.** Upon acceptance of the installation work, the Contractor shall reinstate the Site affected by its operations.

500-4.9 **Payment:** The payment for Service Lateral Connection Work shall be made at the Contract Unit Price or lump sum price in the Bid for each Service Lateral Connection. The Contract Unit Price or lump sum price in the Bid shall include the furnishing and the installation of the Service Lateral Connection sealing system, surface preparation and repairs, preparation and tape submittal of all post cleaning videos and final videos, bypassing if required, and testing, unless otherwise specified in the Special Provisions.

SECTION 705 – WATER DISCHARGES

705-1 **HYDROSTATIC DISCHARGE REQUIREMENTS.** To the City Supplement, ADD the following:

- 3. The discharge of hydrostatic test water and/or potable water shall not contain constituents in excess of the following:

Table 705-1 (A) Effluent Limitations

Parameter	Units	Effluent Limitations
Total Residual Chlorine	mg/L	0.1
pH	units	Within the limits of 6.0 and 9.0 at all times

- 4. Compliance with the effluent limitation shown in Table 705-1 (A) shall be determined based on the 90th percentile of all samples obtained during the discharge event. Non-compliance for each event will be considered separately.
- 5. The discharge of hydrostatic test and/or potable water to Areas of Special Biological Significance (ASBS) is prohibited. These are ocean areas requiring protection of species or biological communities to the extent that alteration of natural water quality is undesirable and are classified as a subset of State Water Quality Protection Areas. Discharges shall be located outside of the designated areas to assure maintenance of natural water quality conditions in these areas. The areas in the San Diego Region include:
 - a) La Jolla (ASBS #29)
 - b) Scripps (ASBS #31)
 - c) La Jolla Shores watershed boundaries

A map showing these areas are to be included **as an Appendix** in the Contract Documents.

6. If a construction project is in the ASBS, the Contractor may discharge their hydrostatic test and/or potable water into the sewer system by obtaining a permit as outlined in the Public Utilities – Wastewater Section policy attached to the Contract. The discharge points and flow data for the existing sewer system are attached to the Contract as an Appendix.

705-2.6.1 **General. Paragraph (3), CORRECT reference to Section 803 to read “Section 703.”**

705-2.6.3 **Community Health and Safety Plan.** To the City Supplement, DELETE in its entirety and SUBSTITUTE with the following:

705-2.6.3 **Community Health and Safety Plan.** See 703-2, “Community Health and Safety Plan.”

SECTION 707 – RESOURCE DISCOVERIES

ADD:

707-1.1 **Environmental Document.** The City of San Diego Environmental Analysis Section (EAS) of the Development Services Department has prepared a **Notice of Exemption** for **Tyrian St. and Soledad Ave. and AC Water Main, Project No. B-12117.02.06**, as referenced in the Contract Appendix. You must comply with all requirements of the **Notice of Exemption** as set forth in the **Contract Appendix A**.

Compliance with the City’s environmental document is included in the various Bid items, unless a bid item has been provided.

END OF SUPPLEMENTARY SPECIAL PROVISIONS (SSP)

TECHNICALS

SECTION 13300 – INSTRUMENTATION AND CONTROL

0.1 WORK OF THIS SECTION

- A. Reference to “ENGINEER” is equal to “Water Operations Engineer”
- B. 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.
- C. 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.
- D. 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 OWNER for the implementation of the I&C and the integration of the I&C with other required instrumentation and control devices.
 - 2. 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.
 - 3. 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.

4. 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.

E. Certification of Intent:

1. Fifteen 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."

F. Documentation of Instrumentation Subcontractor Qualifications:

1. List of at least two instrumentation and control system projects successfully completed, 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 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).

0.2 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

0.3 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

0.4 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.

- 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
- (8) Associated LCP, PLC, PCM, or RCP

3. Test Procedure Submittals:

- a. Submit the proposed procedures to be followed during tests of the I&C and its components, 22 days prior to final testing.
- 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
- 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. 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.

0.5 FACTORY TESTING

- A. Arrange for the Manufacturers of the equipment and fabricators of panels and cabinets supplied under this Section to allow the RESIDENT 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 RESIDENT ENGINEER before testing. No shipments shall be made without the ENGINEER's approval.

0.6 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.

0.7 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.

0.8 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.

0.9 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 1 - PRODUCTS

1.1 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 convertors 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.

1.2 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

1.3 SPARE PARTS AND SPECIAL TOOLS

- A. Spare Parts: Furnish the spare parts selected by the ENGINEER from the priced list of spare parts in the Instrument Submittal and Control Panel Engineering Submittal in conformance with Section 13370 - Control Panels.
- B. 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.
- C. Timing of Submittals: All special tools and spare parts shall be submitted before startup starts, and shall be suitably wrapped and identified.

1.6 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-A	PRS Vault	N/A	4
ZS-B	PRS Vault	N/A	4
ZS-C	FIT Enclosure	N/A	4
ZS-D	RCP Panel	N/A	4

1.7 COPPER TUBING AND CONNECTORS

- A. Copper tubing shall be ASTM B88 or 75, type K or L, Annealed temper (soft copper).
- B. Connectors shall be compression fitted and made of cast copper alloy, brass, or stainless steel. Cast copper alloy fittings shall comply with ASME/ANSI B16.26 specifications.
- C. Thread compounds and lubricants shall be used according to the manufacturer's recommendations. Teflon tape shall not be used.
- D. Copper tubing and connectors shall be Swagelock, Hoke or equal.
- E. Copper tubing supports shall be two hole mounted, made of 304 stainless steel, and have SBR rubber inserts. Use Mc Master-Carr catalog number 8981T25 or equal. Single hole rubber cushioned loop straps are not acceptable.

PART 2 - EXECUTION

2.1 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.

2.2 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

2.3 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.

2.4 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 ENGINEER together with a clear and unequivocal statement that all instrumentation has been successfully calibrated, inspected, and tested.

2.5 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. Final acceptance of the control system shall be based upon plant completion as stated in the General Conditions.

2.4 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.

2.5 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.

2.6 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.

2.7 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 ****

B. Control Panel Engineering Submittal: The CONTRACTOR shall submit a control panel engineering submittal (CPES) for each control panel and enclosure provided under Division 13. The CPES shall completely define and document the construction, finish, layout, power circuits, signal and safety grounding circuits, fuses, circuit breakers, signal circuits, internally mounted instrumentation and SCADA system components, face plate mounted instrumentation components, internal panel arrangements, and external panel arrangements. All panel drawings shall be "B" size, and all data sheets and manufacturer specification sheets shall be "A" size. The submittal shall be in conformance with NEMA Standard ICS-1-1.01, shall be submitted as a singular complete bound volume or multi-volume package within 120 calendar days after Notice to Proceed and shall have the following content:

1. A complete index shall appear in the front of each bound volume. Panels shall be indexed by system or process area, and drawings and data associated with a panel shall be grouped together. All panel tagging and nameplate nomenclature shall be consistent with the requirements of the Contract Documents.
2. Scale construction drawings which define and quantify the type and gauge of steel to be used for panel fabrication, the ASTM A36 grade proposed for structural shapes and straps, panel door locks and hinge mechanisms, type of bolts and bolt locations for section joining and anchoring, details and proposed locations on the use of "Unistrut" members, stiffener materials and locations, electrical terminal box and outlet locations, electrical access locations, print pocket locations, writing board locations and lifting lug material and locations.
3. Scale physical arrangement drawings which define and quantify the physical groupings comprising control panel sections, auxiliary panels, subpanels, and racks. Cutout locations with nameplate identifications shall be indicated.
4. Front of panel layouts for all control panels.
5. Schematic/elementary diagrams depicting all control devices and circuits and their functions.
6. Wiring/connection diagrams locating and identifying electrical devices, terminals and interconnecting wiring. These diagrams shall show interconnecting wiring by lines, designate terminal assignments, and show the physical location of all electrical and control devices.
7. Interconnection diagrams locating and identifying all external connections between the control panel/control panel devices and associated equipment. These diagrams shall show interconnecting wiring by lines, designate terminal assignments, and show the physical location of all panel ingress and egress points.
8. Completed ISA-S20 data sheets for all instrumentation devices associated with each control panel, supplemented with manufacturer specification sheets which verify conformance to the requirements of the Contract Documents.
9. A bill of material which enumerates all devices associated with the control panel.

10. A priced listing of analog spare parts in conformance with Section 13300 - Instrumentation and Control.

1.5 SPARE PARTS AND SPECIAL TOOLS

- A. Control panel spare parts selected by the ENGINEER and special tools shall be provided in accordance with Section 13300 - Instrumentation and Control.
- B. All spare parts and special tools shall be submitted before startup commences, suitably wrapped and identified.

1.6 CERTIFICATION

- A. Each control panel shall bear the UL label. The UL label shall apply to the specific equipment supplied with the enclosure, and the installation and wiring of the equipment within and on the enclosure. If required for UL labeling, provide ground fault interrupters, isolation transformers, fuses, and any other necessary equipment, even though such equipment is not indicated on the Drawings. The fabricator shall be an approved UL listed manufacturer.
- B. The shop that builds the controller must be a UL 508A listed panel shop/fabricator/builder (certified & authorized by UL). This shop will then install a UL sticker of approval on the assembled controller. Otherwise UL or a UL listed third party is needed to inspect, evaluate the work, issue an evaluation report and install the UL approval sticker.

PART 2 -- PRODUCTS

2.1 GENERAL

- A. Environmental Suitability: All 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 no less than 20% below the maximum rated environmental operating level, and at least 20% above the minimum rated environmental operating level. The CONTRACTOR shall provide all power wiring for these devices. Enclosures suitable for the environment shall be furnished.
- B. The control panel controls shall be as shown on the drawings. Control conductors shall be provided in accordance with the indicated requirements.
- C. Each source of foreign voltage shall be isolated by providing disconnecting or pull-apart terminal blocks or a disconnect operable from the control panel front. Each control panel shall be provided with identified terminal strips for the connection of all external conductors. Provide sufficient terminal blocks to connect 25% additional conductors for future use. Discrete outputs from the control panel shall be provided by electrically isolated contacts rated for 5 A at 120 VAC. Analog inputs and outputs shall be an isolated 4-20 mA, 2-wire signals with power supply.

- D. Programmable Logic Controllers (PLCs) may be provided in lieu of relays if the programmable logic controllers match the PLCs provided under Section 13374 - Control Panel Instrumentation.
- E. All control panel mounted devices shall be mounted a minimum of 3 feet above finished floor elevation.
- F. Painting: The interior of the control panel, back-panel, and side-panel(s) shall have a white finish coat.

2.2 CONTROL PANELS

A. Remote Control Panel RCP:

1. Fabricate panels, install instruments, plumb and wire in the factory.
2. Furnish termination panels, if required. Include terminal blocks; interface hardware, wiring, and cabling necessary for a complete system.
3. Use panel fabrication techniques that allow for removal and maintenance of all equipment after installation.
4. Provide equipment-mounting racks of standard construction and dimensions. Provide front access doors only unless specified otherwise. Provide space for internal wiring and for the connection of external wiring.
5. Do not locate any equipment within bottom two inches of panel.
6. All equipment located within the panel shall be rigidly secured.
7. All outdoor panels shall be provided with breather/drain plugs.
8. Provide a hasp on all enclosure covers (doors) for Owner furnished locks. The Owner will supply padlocks.
9. Enclosures shall be 316 stainless steel. Provide single door NEMA type 4X with back panels.
10. Provide structural reinforcements within enclosures to insure a plane surface, to limit vibration and to provide rigidity during shipment, installation and operation without distortion or damage to the panel or to any instrument.
11. Grind and sand exterior welds to a smooth finish free of burrs. Make surfaces free of ridges, nuts, bolt heads and similar protrusions.
12. Internally, supply the enclosures with a structural steel framework or bracing for equipment support and enclosure bracing. Where two or more enclosures are shown mounted immediately adjacent to one another, bolt them securely together with their front faces parallel.

13. Provide each enclosure with full gaskets on covers.

B. Electrical Requirements:

1. Conduit, wireways, switches, wire, and electrical fittings shall be provided for all 115 V circuits to instruments and other electrical devices as required for a complete and operable installation.
2. Conduit, wireways, junction boxes, and fittings shall be provided for all signal wire, thermocouple, or resistance thermometer lead wire. Conduit or wireway runs shall include those required between temperature sensors and temperature transmitters and between the thermocouple wireway or junction box to instruments.
3. Each terminal connection shall have a plastic plate with a terminal and instrument tag number. All wiring shall be identified with stamped tubular wire and markers.
4. Panels shall be provided with two switched 500 lumen LED panel lights. Two lights shall be provided for every 4 feet of panel width and shall be mounted inside and in the top of the back-of-panel area.
5. The RCP shall be provided with a 15-A, 120-V, service outlet circuit within the back-of-panel area. The circuit shall be provided with 3-wire, 120-V, 15-A, duplex receptacles one for every 4 feet of panel width (one minimum per panel), spaced evenly along the back-of-panel area.
6. Wall mounted or pedestal mounted panels shall be so sized as to adequately dissipate heat generated by equipment mounted in or on the panel.
7. The RCP shall be provided with thermostatically controlled heaters that maintain inside temperature above 40 degrees F.
8. A door switch shall control two LED panel lights within the RCP.
9. Wiring methods and materials for all panels shall be in accordance with the NEC requirements for General Purpose (no open wiring) unless otherwise indicated.
10. Signal and Control Circuit Wiring:
 - a. Wire type and sizes: Conductor shall be flexible stranded copper machine tool wire UL listed Type MTW, and shall be rated 600 V. Wires for instrument signal circuits and alarm input circuits shall be No. 14 AWG. All other wires, including shielded cables, shall be No. 16 AWG, minimum.
 - b. Wire Marking: Each signal, control, alarm, and indicating circuit conductor connected to a given electrical point shall be designated by a single unique number which shall be shown on all shop drawings. These numbers shall be marked on all conductors at every terminal using white numbered wire markers which shall be plastic-coated cloth, Brady Type B-500 or equal or shall be permanently marked by heat-shrink plastic.

- c. Flexible conduit is not acceptable except when specifically approved by the ENGINEER in writing.
- d. Conduit fittings shall be Crouse-Hinds cast fittings or equal.
- e. Splicing of wires in conduits is discouraged. If permitted, splicing shall be approved by the ENGINEER and splices shall be soldered or pressure type crimped.
- f. For case grounding, panels shall be provided with a 1/4-inch by 1-inch copper ground bus complete with solderless connector for one No. 4 AWG bare stranded copper cable. The copper cable shall be connected to a system ground loop.

11. DIN Rail Mounted Terminal Blocks:

- a. Provide factory assembled terminal blocks on a mounting channel and bolt the channel to the inside of the panel. Space terminal block strips no closer than 6 inches center to center.
- b. Provide screw type 600 V terminals with pressure plate to accept wire size #12 AWG and smaller. Do not use miniature terminal blocks.
- c. Provide a continuous marking strip with the terminals. Provide a separate terminal for terminating each shield wire.
- d. Reserve one side of each terminal strip for field incoming conductors. Do not make common connections and jumpers required for internal wiring on the field side of the terminal. Terminate no more than two wires at any one terminal.
- e. Provide a minimum of 25 percent spare terminals.
- f. The terminal block shall terminate wires without additional preparation such as tinning of wire ends, special connectors, etc.
- g. The insulation shall have wire entry funnels to facilitate insertion of wires.
- h. The insulating housing shall prevent stray strands from shorting out adjacent terminal blocks.
- i. The terminations shall be gastight to prevent corrosion due to corrosive atmosphere.
- j. Terminal screws shall be captive in the metal body or via the insulation housing.

- k. Once tightened terminal screws shall be useable with accessories such as center or insertion bridges; test sockets; separating plates, end covers, etc.
 - l. Provide fusible terminal blocks with fuses and blown fuse indicators for each signal loop.
 - m. Manufacturer: Phoenix Contact or equal.
12. DIN Rail Mounted Circuit Breakers:
- a. Circuit breakers shall be 115 VAC, single pole as manufactured by Allen Bradley Series 1492-GH; no equals.
13. Relay Sockets:
- a. Sockets for control relays shall be rated 5 amperes. Terminal screws shall be on the "Pressure Screw" type. Sockets shall be mounted via DIN rail and related hardware. Sockets shall be as manufactured by Allen Bradley Series 700-HN101; or approved equal.
14. Control Relay:
- a. Magnetically held relays shall have one spare contact. Control relays shall have contacts rated for 10-ampere inductive load, 125 volts, with coil voltage, number of poles, and pole arrangement as indicated on the plans. Relays shall be of the indicating type. Provide Allen Bradley Series 700-HA; or approved equal.
15. Selector Switches and Indicating Lights:
- a. Selector switches and indicating lights shall be supplied by one manufacturer and be of the same series or model type.
 - b. Type: Heavy duty, oil tight.
 - c. Selector switch contacts shall be rated for AC or DC current with devices simultaneously operated by the switch contacts but not less than 10 Amps resistive at 120 VAC/VDC continuous.
 - d. Indicating lights shall be rated for 120 VAC. Lamps shall be high visibility LED type, long life (20,000 hours minimum). Indicating lights shall be push-to-test.
16. Electrical Locations:
- a. Terminal boxes for incoming and outgoing signal leads shall be located at the top or bottom of the panel as indicated or as otherwise required.
17. Power Supply Wiring:

- a. Unless otherwise indicated, all instruments, alarm systems, and motor controls shall operate on 24 VDC.
 - b. At a location near the top of the panel (or bottom), the panel fabricator shall provide terminal box connections for the main power supply entry.
 - c. Instruments located on the same panel section and serving the same process unit may be connected to a common branch circuit from the power supply. The number of circuits depends on the circuit load as indicated. Different panel sections or different process units shall not use common branch circuits. When instruments are not equipped with integral fuses, fuses shall be provided as required for the protection of individual instruments against fault currents. Fuses shall be mounted on the back of the panel in a fuse holder, and each fuse shall be identified by a service name tag.
 - d. Each potentiometer type instrument, electronic transducer, controller, or analyzer shall have an individual disconnect switch. Disconnect switches shall have metal or plastic tags indicating instrument tag numbers. Individual plug and cord set power supply connections may be used without switches when indicated.
18. Alarm Wiring: The panel vendor shall provide all alarms including light cabinets, audible signal units, test and acknowledge switches, and remote logic units as indicated. Interconnecting wiring to panel mounted initiating devices shall also be wired by the panel vendor. The wiring from external initiating devices shall be provided by the installation contractor. Where plug and cord sets are provided for component interconnection, the panel vendor shall harness and support the cables in neat and orderly fashion. Where separate wire is required, panel vendor shall install No. 16 AWG with THWN or THHN insulation between all components.
19. Signal Wiring:
- a. Signal Wire - Non Computer Use:
 - (1) Signal wire shall be twisted pair or triads in conduit or troughs. Cable shall be constructed of No. 16 AWG copper signal wires with THWN or THHN insulation.
 - (2) Color code for instrument signal wiring shall be as follows:

Positive (+): Black
Negative (-): White
 - (3) Multiconductor cables where indicated shall consist of No. 16 AWG copper signal wires twisted in pairs, with 90-C, 600-V fault insulation. A copper drain wire shall be provided for the bundle with a wrap of aluminum polyester shield. The overall bundle jacket shall be PVC.

- b. Multi-conductor cables, wireways and conduit shall be sized to allow for 10% spare signal wire.

20. 24 VDC Power Supply:

- a. Panels shall be equipped with a linear 24 volt D.C. power supply for driving current loops and other D.C. powered equipment. It shall be solidly mounted, labeled and located in plain view oriented for ease of maintenance. Unit shall be sized based on 200% of load requirements of equipment actually furnished. 24 VDC power supply shall be SITOP order No. 6EP3334-8SB00-0AY0, 120/230 Vac input, 24 Vdc output, 10A (12A up to +45°C), with 3% +/- voltage regulation from no-load to full-load.

21. UPS System:

- a. The UPS system shall be Siemens DC UPS module SITOP UPS500S – 24V / 15A, RFI specification – class B, and Degree of protection – IP20. Output current rated value shall be 15A and charge current approximately 1A.

(3) Basic Unit Order No. 6EP1 933-2EC51; Qty. 1.

(4) Expansion Module Order No. 6EP1 935-5PG01; Qty. 5.

- C. Labor and Workmanship: All panels shall be fabricated, piped and wired by fully qualified workmen who are properly trained, experienced, and supervised.

PART 3 -- EXECUTION

3.1 INSTALLATION

A. Preparation and Shipping:

1. Crate panels for shipment using a heavy framework and skids. The panel sections shall be cushioned to protect the finish of the instruments and panel during shipment. All instruments which are shipped with the panel shall further have suitable shipping stops and cushioning material installed to protect parts which could be damaged due to mechanical shock. Each separate panel unit shall be provided with removable lifting lugs to facilitate handling.
2. All shipments shall be by air ride van, unless otherwise indicated.
3. All control panel testing and inspection shall be performed before shipping.

- B. Control panels shall be installed in accordance with Section 13300 - Instrumentation and Control.

3.2 CONTROL PANEL SIGNAL AND CONTROL CIRCUIT WIRING

- A. **Wiring Installation:** All wires shall run in plastic wireways except for the following:
 - 1. Field wiring.
 - 2. Wiring between mating blocks in adjacent sections.
 - 3. Wiring to panel-mounted components.
- B. **Wiring to Rear Terminals:** Wiring to rear terminals on panel-mount instruments shall be in plastic wireways secured to horizontal brackets above or below the instruments in about the same plane as the rear of the instruments.
- C. Shop drawings shall show conformance to the above wiring installation requirements.
- D. **Wire Marking:** Each signal, control, alarm, and indicating circuit conductor connected to a given electrical point shall be designated by a single unique number which shall be shown on all shop drawings. These numbers shall be marked on all conductors at every terminal using white numbered wire markers which shall be plastic-coated cloth, or permanently marked heat-shrink plastic.
- E. Wires shall be fitted with a crimp type spade lug of the proper size at screw terminals except in the cases of termination fittings designed for compression or solder type termination. There shall be at least 2" of unencumbered wire extending from any point of attachment within the panel. Wire numbers shall be located within 1" of the point of attachment and shall be applied such that the number can be read from the front of the panel without rotating the wire. No more than two wires shall be located at any point of termination, including terminal blocks (terminal blocks specified are designed to accept two points of termination at each side).
- F. Wires shall be routed through Panduit brand wireway of the size shown on the drawings. Routing shall separate 24 Vdc paths from 120 Vac paths as far as possible. Wireway shall be secured to the removable back panel by multiple pan head screws of the proper size at intervals of one at every other mounting hole station provided by Panduit. The mounting hole station shall be completely utilized at the extreme ends of each wireway segment. Within wireway, wire bundles shall be loosely bound with individual plastic tie wraps at intervals of approximately two feet.
- G. External to wireway, wire shall be bundled neatly and secured with plastic tie wraps at intervals of approximately 8". Wire splicing within the Instrument Panel is not acceptable.
 - 1. Wiring color code shall be as shown in this subsection
 - a. Blue: 24vdc +
 - b. Brown: 24vdc B
 - c. White: 120vac common

- d. Black: 120vac power
- e. Red: 120vac control power
- f. Green: ground
- g. Violet: 12vdc +
- h. Yellow: 12vdc B
- i. Belden black (+)
- j. Belden clear (-)

- H. Panels shall be fitted with a duplex electrical outlet as shown on the drawings. Illumination at the panel interior shall be by LED panel lights operated by a door switch. Provide a door switch wired to the terminal blocks, as shown on the drawings, to indicate when the RCP door is open.
- I. Legend plates shall be laminated plastic or phenolic, black over white engraved by removing black material to reveal white letters. Lettering shall be sharp and clear, 3/16" nominal height. Engraving which is not uniform either letter to letter or within each character will not be accepted. Tags identifying interior components shall be affixed to the cabinet back panel.
 - 1. The following interior components shall be labeled with phenolic tags:
 - a. Low voltage relay
 - b. Control relays
 - c. Modicon PLC
 - d. Microwave Data Systems Radio
 - e. AC line surge arrester
 - f. DC UPS
 - g. DC power supply
 - h. Each terminal strip

3.3 CALIBRATION, TESTING, AND INSTRUCTION

- A. General: Calibration, testing, and instruction shall be performed in accordance with Section 13300 - Instrumentation and Control.
- B. Inspection and Approval:

1. The panel fabricator shall conduct the following tests before shipment:
 - a. All alarm circuits rung out to determine their operability.
 - b. All electrical circuits checked for continuity and where applicable, operability.
 - c. All nameplates checked for correct spelling and size of letters.
 - d. Any other test required to place the panel in an operating condition.
2. The CONTRACTOR shall furnish all necessary testing devices and sufficient manpower to perform the tests required by the ENGINEER.
3. If the above tests have not been performed before shipment, the CONTRACTOR shall be liable for back charges by the ENGINEER for the extra time required for inspections.
4. Each control panel shall be tested in the field for functional operation after the connection of external conductors, and before equipment startup.

**** 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
 - 2. Section 13370 Control Panels

1.3 CONTRACTOR SUBMITTALS

- A. Shop drawings, information, and data sheets shall be submitted in conformance with the requirements of Section 13300 - Instrumentation and Control and Section 13370 - Control Panels.
- B. 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. Provide a PLC system as shown on the drawings and detailed in these specifications. Provide all I/O (analog and discrete), interface modules, and other cabling and hardware as needed to provide a fully functioning system meeting these specifications.
- B. 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.
- C. Provide comprehensive documentation of the program logic, as required in Section 3.

1.5 SOFTWARE LICENCES

A. General

1. Provide the City a non-exclusive, fully paid, perpetual license to use all the software supplied as part of this contract.
2. Provide unlimited license for all Application Software developed or configured by the Instrumentation Subcontractor for this project. Unlimited to mean the City has the right to:
 - a. Use, duplicate and modify the software in any manner, in whole or in part.
 - b. Use the software in any quantity, with any type of equipment, and for any purpose.
 - c. To make back-up copies of all software.

B. Software updates

1. Provide the City with 12 months free software updates and technical support for all manufacturer's software supplied as part of this project.
2. Upgrades and patches shall be installed by the Instrumentation Subcontractor. Schedule upgrades with the Owner.
3. The Instrumentation Subcontractor to test system after upgrade.

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 Owner 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 Owner 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.
 4. A copy of all software licenses with the City named as the software owner.
 5. Provide owner with an unrestricted and current software disk of Unity Pro by Schneider Electric.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The PLC system shall operate in ambient conditions of 32 to 140°F temperature and 5 to 95 percent relative humidity without the need for purging or air conditioning
- B. PLC system shall be designed with high noise immunity to prevent occurrence of false logic signals resulting from switching transients, relay, and circuit breaker noise or conducted and radiated radio frequency interference.
- C. The controller shall be grounded to the panel ground bus with a separate ground conductor sized per the manufacturers grounding requirements.

- D. 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, No "Or 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 #170MC100700.
 - 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 13390 – COMMUNICATIONS

PART 1 - GENERAL

1.1 WORK OF THIS SECTION

- A. Reference to “ENGINEER” is equal to “Water Operations Engineer”
- B. The Work of this Section includes providing a complete and operational communication system between the remote project facilities and the existing Water Operations Control Systems Center. The system shall include interface hardware, modules, radio, communication bridges, and application software necessary for a communication network.
- C. The Work, equipment, and services required by this Section shall be provided and furnished by the Communication System Contractor.

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 13300 Instrumentation and Control
 - 2. Section 13370 Control Panels
 - 3. Section 13374 Control Panel Instrumentation
 - 4. Section 16010 Basic Electrical Materials and Methods

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:
 - 1. Uniform Fire Code
 - 2. National Electrical Code
- B. Except as otherwise indicated, the current editions of the following standards apply to the Work of this Section:
 - 1. ISA RP 55.1 Hardware Testing of Digital Process Computers
 - 2. NEMA ICS-6 Enclosures for Industrial Controls and Systems
 - 3. MIL Q STD 9858A Quality Program Requirements

- | | | |
|-------|---------------|---|
| 4. | MIL STD 2170 | Reliability Prediction of Electronic Equipment |
| 5. | IEEE 802.2 | Reliability Prediction of Electronic Equipment |
| <hr/> | | |
| 6. | SAMA PMC-32 | Logical Link Control |
| 7. | SAMA PMX-32.1 | Process Instrumentation Reliability Terminology |

1.4 CONTRACTOR SUBMITTALS

- A. Shop drawings of all products listed in Part 2 shall be submitted.

1.5 ENVIRONMENTAL CONDITIONS

- A. The communication systems shall be designed and constructed for operation under the following environmental conditions:

1. Equipment outdoors, coastal environment:
 - a. Temperature range: 32 through 104 degrees F
 - b. Thermal shock: two degree F per minute maximum
 - c. Relative humidity: 20 through 90%

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Delivery of Materials: Products shall be delivered in original, unbroken packages, containers, or bundles bearing the name of the manufacturer.
- B. Storage: Products shall be carefully stored in a manner recommended by the manufacturer in an area that is protected from the elements.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Where there is more than one item of similar equipment being furnished under this Section, all equipment of the same type shall be the product of a single manufacturer.
- B. All components shall be the most recent field proven models marketed by their manufacturers at the time of submittal of the shop drawings unless otherwise indicated.
- C. All instrumentation shall be suitable for operation in the ambient conditions at the equipment installation locations. Heating, cooling, and dehumidifying devices shall be incorporated with the outdoor instrumentation in order to maintain it

within its rated environmental operating ranges. The Communication System Contractor shall provide all power wiring for these devices.

- D. The Communication System Contractor shall coordinate the installation of the communication system with all applicable utility companies and regulatory agencies having jurisdiction to secure approvals and permits which are required.

2.2 RADIO TELEMETRY

A. Licensing and Surveying:

1. The OWNER has FCC licensing for the sites included in this project. The license allows the OWNER to operate 928-952 MHZ frequencies for multiple address systems (MAS). The equipment provided shall be suitable for use on the assigned frequencies.
2. The sites included in this Contract have been surveyed and are included in the radio feasibility study performed by the CITY OF SAN DIEGO. The results of this survey indicate reliable radio communications can be implemented between the central station and remote sites.
3. Before installation of the radio equipment, the Communication System Contractor shall verify that the radio paths are still reliable based on the present terrain and structure conditions. Any structures or other objects that may obstruct the radio paths or cause transmission or path fade margin problems shall be brought to the ENGINEER's attention immediately.

- B. Transmission: RF transmitters shall be directly frequency modulated by a built-in digital modem from the digital data stream furnished by the central computer system. RF receivers shall provide a digital data stream to the central computer system. Each assembly shall be capable of transmitting and receiving data at a rate of 9600 baud over a 928-952 MHz FCC assigned channel.

- C. Fixed Frequency Radio: The fixed frequency radio in the RCP shall be capable of processing data for transmission via an antenna system. The contractor shall install the fixed frequency radio inside the RCP Cabinet. The radio equipment and accessories shall be mounted on a single panel supplied by the manufacturer. General Electric Digital Energy MDS model SD09MD-CES-NNSNN shall be furnished

1. General:

- a. Frequency Range: 928-960MHz
- b. Channel Bandwidth: Configurable for 25KHz or 12.5KHz
- c. Operating Mode: Half Duplex

2. The City shall be responsible for configuring each data radio to interface with the PLC controller or SCADA system as required.

D. Directional Patch Antenna System

1. The 902 – 928 MHz directional patch antenna shall have the following features:
 - a. 60-degree Beam Width
 - b. Horizontal Polarity
 - c. 9 dBi of Gain
 - d. Manufacturer: HyperLink Model HG8909P; or approved equal.
2. Antenna feed lines shall be 1/4-inch low loss coax for remote sites. Feed lines shall be routed to radio transceivers through conduit or inside the antenna mast. Provide Andrew Superflex FSJ1-50A. Coax connectors shall be 1/4-inch male N, Andrew F1PNM-H (QTY 2). Crimp style male N connector shall be Amphenol RFX (QTY 2). Jumper coax shall be RG58U 50 ohm dual shield solid center conductor.
3. Transmission lines and the antenna system shall be grounded.
4. The lightning arrestor is a Polyphaser IS-B50LN-C2.

2.3 NAMEPLATES, TOOLS AND SPARE PARTS

- A. Tools: The Work includes all tools required to repair, calibrate, program, and maintain the equipment.
- B. Test Equipment: It is intended that the diagnostic software furnished with the system shall be able to troubleshoot communications to the circuit board level and that local repairs will be limited to board replacement. Any special diagnostic tester required to perform troubleshooting to this level shall be furnished. A portable calibrator for the radio system shall be furnished.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: The Communication System Contractor shall employ installers who are skilled and experienced in the installation and connection of all the elements, accessories and assemblies of communication systems.
- B. Access: All equipment shall be provided as indicated, or, if not indicated, so that it will be readily accessible for operation and maintenance. The ENGINEER

reserves the right to require minor changes in equipment location before roughing in without any additional cost to the OWNER.

- C. Review: The Communication System Contractor shall review the existing site conditions and examine all shop drawings for equipment in order to determine exact routing and final terminations for all wiring and cables. Exact routing shall be shown on the Record Drawings.
- D. Installation and Connection: The Communication System Contractor shall install and connect all field-mounted components and assemblies and as recommended by the manufacturer and as indicated.
- E. Conduits: In building interior locations, conduits shall be surface mounted on walls or ceilings wherever possible and parallel to building lines. Conduit shall not be routed on floors unless indicated otherwise. In exterior locations, conduit shall be routed below grade. Existing concrete or asphalt slabs shall be sawcut, conduit installed, and the cut repaired to original condition. Exposed conduit and raceway shall be installed perpendicular or parallel to building lines.
- F. Final Checks: Final check of the communication systems shall be performed as an integral part of the system specified in Section 13300 - Instrumentation and Control.

3.2 FIELD TESTING

- A. RF Equipment Testing: The following measurements shall be made, recorded and compared to normal reading on each RF assembly prior to system testing to ensure that all equipment meets published specifications:
 - 1. Operating voltages
 - 2. Transmitter frequency
 - 3. Transmitter output power (at output of duplexer)
 - 4. Transmitter deviation
 - 5. Receiver local oscillator frequency
 - 6. Receiver sensitivity (10 to -6 BER)
- B. Testing: All systems furnished under this Contract shall be exercised through operational tests in the presence of the RESIDENT ENGINEER in order to demonstrate compliance with requirements. The testing of the communication system shall be performed in accordance with and as an integral part of the testing of the instrumentation and control specified in Section 13300 - Instrumentation and Control.

**** END OF SECTION ****

SECTION 13414 - FLOW COMPUTER KIT- METERING VALVE

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes the requirements for flow monitoring on pressure reducing valves. Provide enclosure as indicated in the drawings.
- B. The regulating valves include instrumentation and flow computer equipment to provide accurate flow measurement. An output signal of 4-20 milli-Amps shall be provided for the appropriate range of flow.
- C. Related sections include:
 - 1. Section 13300 - Field Mounted Instrumentation.
 - 2. Section 13430 – Pressure Transmitters
 - 3. Section 15114 – Pressure Regulating Valves

1.2 SUBMITTALS

- A. Provide catalog data for all products listed in Part 2.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide instruments which are capable of meeting the following performance requirements when installed in accordance with the manufacturers recommendations:

Accuracy: +/-1.0 percent

Repeatability: +/-0.5 percent

Linearity: +/-0.5 percent

Measurement Range: 1 to 20 FPS minimum, maximum pressure differential of 100 psi.

1.4 EXISTING CONDITIONS

- A. All pressure regulating valves with flow metering kit under these contract documents are 6", and 8" CLA-VAL Pressure Reducing Valves, in accordance with Section 15114.

B. MAINTENANCE

- 1. Include the following spare parts:
 - a. One set of manufacturers recommended spare parts.

PART 2 -- PRODUCTS

2.1 FLOW COMPUTER KIT

- A. The flow computer kit shall contain the following components:
 - 1. NEMA 4 Differential pressure transmitters shall be provided by Cla-Val and selected for the differential pressure range of each metering valve. Refer to Section 13430.
 - 2. A NEMA 4 metering valve position transmitter, CLA-VAL Model No. X117C, and valve stem adapter.
 - 3. Microprocessor (flow computer) with proprietary algorithm program to compute the flowrate and to display and provide an output flow signal.
- B. The NEMA 4 flow computer kit shall be CLA-VAL Model No. 131 VF flow module. The flow modules shall be have DIN mounting and loose shipped for remote mounting.

Tag No.	Service	Range	Drawing
FIT-100	8 inch valve	TBD	E-13
FIT-200	8 inch valve	TBD	E-13

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Verify valve model number, size, pressure class, and other information required by the manufacturer for programming and other requirements. The Contractor is responsible for field verifying all required information.
- B. Modify existing valves as recommended by the manufacturer. Locate components as indicated on the plans. Provide all adapters as required.

****END OF SECTION****

SECTION 13427 - LIQUID LEVEL SWITCH - FLOAT (TILT)

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes the requirements for float level switches used vault flood detection.
- B. Related sections include:
 - 1. Section 13300 – Field Mounted Instrumentation

1.2 SUBMITTALS

- A. Provide catalog data for all products listed in Part 2.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide level float switches capable of meeting the following performance requirements when installed in accordance with the manufacturer's recommendations.
 - 1. Repeatability: +/- 1.0 inch of float setting.
 - 2. Temperature: 32 to 130 degrees F.
 - 3. Electrical: SPDT Normally Closed Mercury Switch, rated for 2 amps at 120 Vac.

1.4 MAINTENANCE

- A. Include the following spare parts:
 - 1. One float with integral sealed watertight switch assembly.

PART 2 -- PRODUCTS

2.1 FLOAT SWITCH

- A. Provide switch assemblies as follows:
 - 1. Switch Float: Constructed of molded polyethylene or approved equal.
 - 2. Switch Configuration: Float shall be equipped with two switches. One switch shall be closed and the other open below the float's setpoint. Above the setpoint, the switch positions shall reverse. Setpoint differential shall be 1-inch
 - 3. Cable: Cable insulation suitable for continuous submergence in water. Conductors shall be minimum 14 AWG stranded copper. Cable length to suit the installation.

4. Termination Cabinet: Terminate float switch cables in the flow transmitter enclosures indicated.

- B. Provide Flygt ENM-10 or equal by Consolidated Electric, Anchor Scientific, or approved equal. Include mounting hardware.

Tag No.	Size	Trip Set Point	NEMA Rating
LSH	N/A	N/A	4
LSL	N/A	N/A	4

2.2 FLOOD SWITCH

- A. Switch shall be a stem mounted float device with 304 stainless steel stem, Buna N Float Material, Lucite Slosh Shield, IMO/GEMS Model LS-270 or approved equal.

Tag No.	Size	Trip Set Point	NEMA Rating
LSHH	N/A	N/A	4

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Provide junction box in the vault with a non-metallic cord grip connector for support of suspended float switch. Wire the float switch using the manufacturer's recommended flexible cable to the remotely located flow transmitter enclosure indicated.
- B. Provide easily removable switch for maintenance or cleaning, without emptying the vault where mounted.
- C. The vault flood switch shall be approximately 2 to 4 inches in diameter. Vault flood switches shall detect a flood condition 3 inches from the floor.

**** END OF SECTION ****

SECTION 13430 - PRESSURE TRANSMITTER

PART 1 -- GENERAL

1.1 SUMMARY

- A. This section describes the requirements of two-wire type pressure transmitters.
- B. Related sections include:
 - 1. Section 13300 – Field Mounted Instrumentation.

1.2 SUBMITTALS

- A. Provide catalog data 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: +/-0.10 percent of calibrated range.
 - 2. Repeatability: +/-0.05 percent of calibrated range.
 - 3. Drift: Less than +/-0.5 percent of span for a six month period.
 - 4. Temperature Effect: Less than +/-0.05 percent per one degree F. of span from -30 to 150 degrees F.
 - 5. Rangeability: 40 to 1
 - 6. Configurations: Gage Pressure

PART 2 -- PRODUCTS

2.1 PRESSURE TRANSMITTER

- A. Meet the following unless otherwise noted on the instrument schedule:
 - 1. Mounting: Provide stainless steel wall mounting hardware.
 - 2. Power Supply: 12-45 Vdc.
 - 3. Output: 4-20 mAdc into 1500 ohms load. Linear output for gage pressure and square root output function for differential pressure.

4. Zero Suppression or Range Elevation: 150 percent of calibrated span.
5. Range: 9 – 360 psi
6. Maximum Static Pressure: 2,300 psig.
7. Humidity: 10 to 100 percent Relative Humidity.
8. Sensing Element: Diaphragm type.
9. Vent/Drain position: Upper, one for each sensing cavity.
10. Material: Sensing element components to be 316 stainless steel. NEMA 4X electronic enclosure
11. Process Connection: 0.5 inch 14 NPT
12. Electrical Connector: 0.5 inch 14 NPT.
13. Identification plate: 316 SST plate with site mnemonic, tag and loop numbers. Use SST wire to fasten plate to instrument for easy viewing.
14. Design: Provide microprocessor-based electronic design with HART protocol digital communication.
15. Manufacturer: SMAR model LD301 or equal.

- B. Provide gage pressure transmitters for pipeline. Provide differential pressure transmitters for flow measurement.

Tag No.	Service	Range	Drawing
DPT-100	8" Valve	TBD	E-3
PIT-370	Zone 370 Pressure	TBD	E-3
DPT-200	8" Valve	TBD	E-3
PIT-610	Zone 610 Pressure	TBD	E-3

2.2 ACCESSORIES

- A. Provide 2-valve manifold and pipe mount bracket for each transmitter.

PART 3 -- EXECUTION

3.1 INSTALLATION

- A. Install the transmitter in an orientation where the sensing diaphragms are in a vertical plane.
- B. Allow sufficient clearance overhead for cover removal and around the transmitter to provide an access for necessary adjustments.
- C. Where transmitters are located below the pressure tap slope horizontal lines (tubing) a minimum of one inch per foot downward from the pressure taps.
- D. Where transmitters are located above the pressure tap slope horizontal lines a minimum of one inch per foot upward from the pressure tap.
- E. Pressure lines from the tap location to the transmitter shall not have changes in elevation that trap air in the line.
- F. Assemble screwed fittings with Teflon paste or compatible metallic paste on the external threads. Teflon tape shall not be used.
- G. Local output indicators to be easily accessed for viewing and service by operations personnel.

****END OF SECTION****

SECTION 16010 - BASIC ELECTRICAL REQUIREMENTS

PART 1 -- GENERAL

1.1 SUMMARY

- A. Reference to “ENGINEER” is equal to “Water Operations Engineer”
- B. 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 owner 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 pudding, 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)	Connector, Plug, Receptacle and Cable Outlet, Electrical Power
FS W-S-896E/GEN(1)	Switches, Toggle (Toggle and Lode), Flush Mounted (ac)
FS WW-C-581D, E	Conduit, Metal, Rigid, And Intermediate; And Coupling, Elbow, and Nipple, Electrical Conduit: Steel, Zinc Coated
- Commercial Standards:
- | | |
|------------|---|
| ANSI C80.1 | Zinc Coated, Rigid Steel Conduit, Specification for |
|------------|---|

ANSI C80.4	Fittings for Rigid Metal Conduit and Electrical Metallic Tubing, Specifications for
ANSI/UL 467	Grounding and Bonding Equipment, Safety Standard for
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	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 Owner's equipment, unless otherwise approved by the Owner or Engineer.
- 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.

E. 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 Engineer or 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.
- 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. Reference to "ENGINEER" is equal to "Water Operations Engineer"
- B. 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.
- C. 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 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. Detail 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 CONTROL PANELS

- A. The Contractor shall be responsible for the following installation work:
 1. Mounting of the RCP Panel, PIT Enclosure, and the FIT Enclosure.
- 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 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

1.01 SECTION INCLUDES

- A. Arrangement with Utility Companies for permanent electric service.
- B. Underground service entrance.
- C. Metering equipment.

1.02 RELATED SECTIONS

- A. Section 16110 - Raceways.
- B. Section 16450 - Grounding.

1.03 REFERENCES

- A. ANSI/NFPA 70 - National Electrical Code.

1.04 SYSTEM DESCRIPTION

- A. System Characteristics: 120/240 volts, single phase, three-wire, 60 Hertz.

1.05 SUBMITTALS

- A. Submit under provisions of the General Requirements.

1.06 QUALITY ASSURANCE

- A. Perform Work in accordance with Utility Company written requirements.
- B. Maintain one copy of each document on site.

1.07 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.

1.08 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on Utility Company drawings.

PART 2 PRODUCTS

2.01 GENERAL

- A. Locate meter pedestal such that the pull section access meets the requirements of SDG&E.

2.02 MANUFACTURERS

- A. Milbank.
- B. Meyers.
- C. Substitutions: Approved equals.

2.03 METER PEDESTAL

- A. Ratings: NEMA 3R enclosure, 100 amp, 120/240 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

3.01 EXAMINATION

- A. Verify that service equipment is ready to be connected and energized.

3.02 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.

3.03 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 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.
 - 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
NOTICE OF EXEMPTION

NOTICE OF EXEMPTION

(Check one or both)

TO: X RECORDER/COUNTY CLERK
P.O. BOX 1750, MS A-33
1600 PACIFIC HWY, ROOM 260
SAN DIEGO, CA 92101-2422

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 NO.: B-12117.02.06

PROJECT TITLE: Tyrian St & Soledad Ave and AC Water Main

PROJECT LOCATION-SPECIFIC: The project is located entirely within existing City utility easements and the developed public right-of-way within the La Jolla Community Plan area (Council District 1), and would affect portions of the following streets: Tyrian Street, Rosemont Street, Electric Avenue, Castellana Road, Puente Drive, Hillside Drive, and Soledad Avenue.

PROJECT LOCATION-CITY/COUNTY: San Diego/San Diego

DESCRIPTION OF NATURE, PURPOSE, AND BENEFICIARIES OF PROJECT: This project would include replacement and/or realignment of a total of approximately 1,261 linear feet (LF) of concrete and vitrified clay sewer mains with polyvinyl chloride (PVC) pipe for the purposes of increasing overall pipe strength, sewer flow and decreasing the chances of sewer main back-ups and/or pipe breaks.

The project will also include installation of approximately 1,350 LF of PVC pipe replacing existing asbestos cement water pipe within existing trench alignments and installation of approximately 25 LF of new water main. The installation of water main will consist of conventional open trench method.

Associated sewer improvements would include installation of new manholes, rehabilitation of existing manholes, replacement of sewer laterals, re-plumb of sewer laterals, abandonment of two sewer mains and associated manholes, construction of curb ramps, replacement of a fire hydrant, street resurfacing and/or slurry, and installation of a new water pressure reducing station (PRS) (10' x 12' underground vault) and associated supervisory control and data acquisition (SCADA) pole and antenna with a maximum height of 30 feet.

NAME OF PUBLIC AGENCY APPROVING PROJECT: San Diego/San Diego

NAME OF PERSON OR AGENCY CARRYING OUT PROJECT: City of San Diego Public Works Department,
Contact: Jericho Gallardo, Project Manager, Ph: (619) 533-7523
525 B Street, Suite 750, San Diego, CA 92101

EXEMPT STATUS: (CHECK ONE)

- () MINISTERIAL:
() DECLARED EMERGENCY:
() EMERGENCY PROJECT:
() CATEGORICAL EXEMPTION:
(X) STATUTORY EXEMPTIONS: Section 15282 (k) Other Statutory Exemptions - Pipelines Less Than One Mile

REASONS WHY PROJECT IS EXEMPT: The City of San Diego conducted an environmental review and has determined the project meets the statutory exemption criteria set forth in CEQA State Guidelines, Section 15282 (k) - Pipelines Less Than One Mile, and as set forth in Section 21080.21 of the Public Resources Code as long as the project does not exceed one mile in length.

LEAD AGENCY CONTACT PERSON: James Arnhart, Senior Planner

TELEPHONE: (619) 533-5275

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

CARRIE PURCELL, PRINCIPAL PLANNER

10/13/15
DATE

CHECK ONE:
(X) SIGNED BY LEAD AGENCY
() SIGNED BY APPLICANT

DATE RECEIVED FOR FILING AT 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.)

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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.

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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.

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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.

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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

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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	PAGE 8 OF 10	EFFECTIVE DATE
FIRE HYDRANT METER PROGRAM (FORMERLY: CONSTRUCTION METER PROGRAM)		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).

**Larry Gardner
Water Department Director**

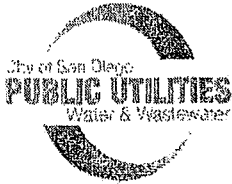
- Tabs: 1. Fire Hydrant Meter Application
2. Construction & Maintenance Related Activities With No Return To Sewer
3. Notice of Discontinuation of Service

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)

METER SHOP (619) 527-7449

NS REQ	FAC#
DATE	BY

Application Date	Requested Install Date:
------------------	-------------------------

Meter Information

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:	
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			

Fire Hydrant Meter Removal Request		Requested Removal Date:
Provide Current Meter Location if Different from Above:		
Signature:	Title:	Date:
Phone: ()	Pager: ()	

City Meter	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

City of San Diego, Field Engineering Div., 9485 Aero Drive, SD CA 92123		Contractor's Name:	
Project Name:		Contractor's Address:	
Work Order No or Job Order No.			
City Purchase Order No.		Contractor's Phone #:	Invoice No.
Resident Engineer (RE):		Contractor's fax #:	Invoice Date:
RE Phone#:	Fax#:	Contact Name:	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%	\$ -
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%	\$ -
18					\$ -		\$ -		\$ -	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: _____

APPENDIX E
LOCATION MAPS

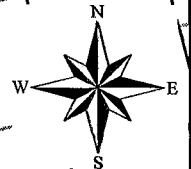
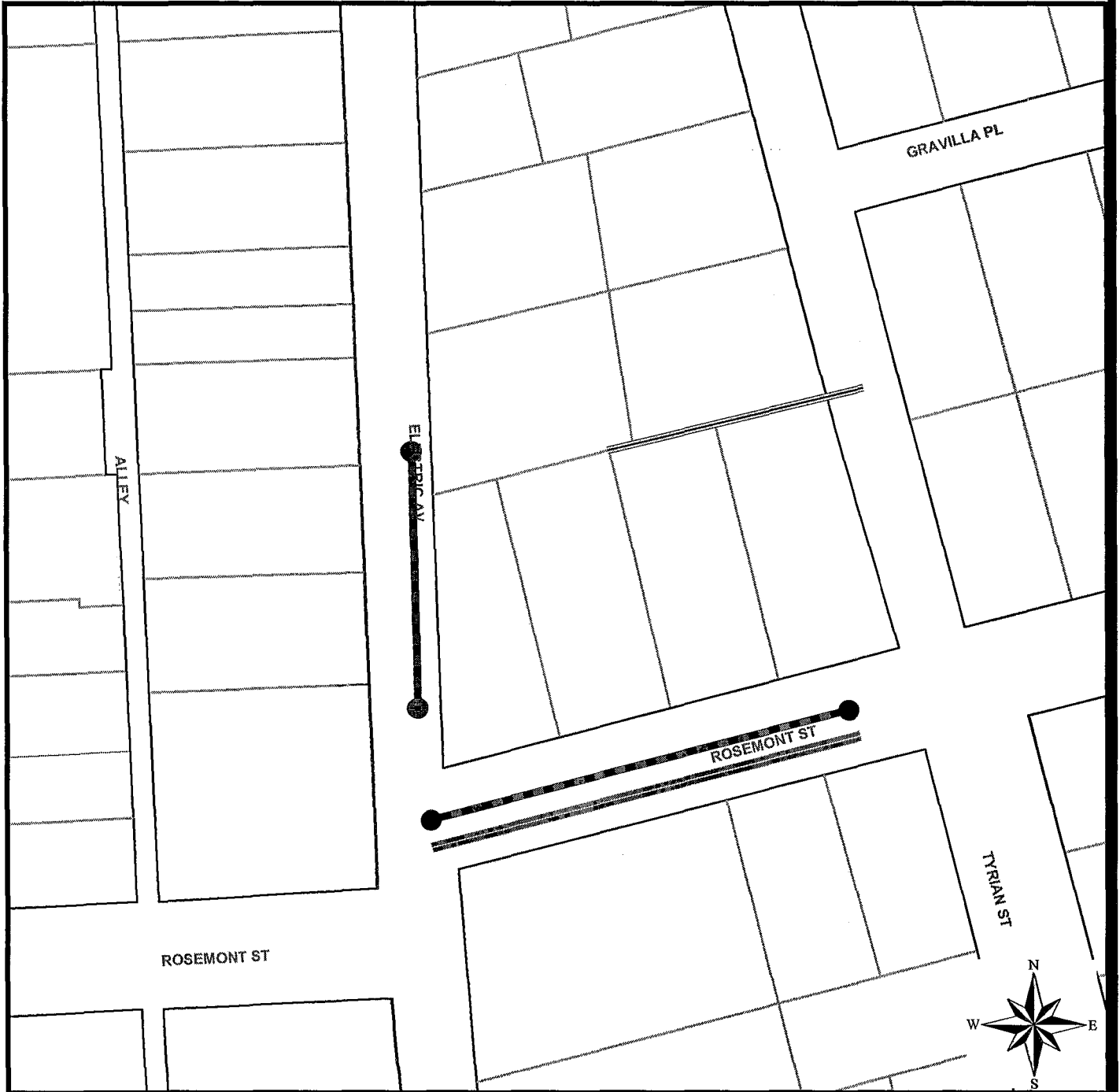
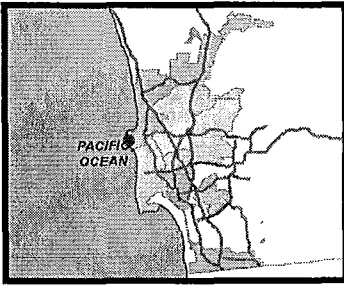
TYRIAN ST & SOLEDAD AVE AND AC WATER MAIN

SENIOR ENGINEER
SHEILA BOSE
619-533-4698

PROJECT MANAGER
JERICO GALLARDO
619-533-7523

PROJECT ENGINEER
JAIME RAMOS
619-533-5103

CONSTRUCTION PROJECT
INFORMATION LINE
(619) 533-4207



Legend

- | | | | | |
|-------------|------------------|-------------------------|------------------------|-------------------------|
| ● EX MH | == WTR 12-in R/P | — SWR 8-in NEW | --- SWR 8-in Rehab | ▨ PRS |
| ● NEW MH | == WTR 8-in NEW | --- SWR 8-in Pipe Burst | --- SWR 8-in Tunneling | ▨ SCADA INSTRUMENTATION |
| ● PVC LINED | == WTR 8-in R/P | --- SWR 8-in R/P | | == Sewer Abandonment |
| ● REHAB | == WTR 16-in R/P | | | |



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TYRIAN ST & SOLEDAD AVE AND AC WATER MAIN

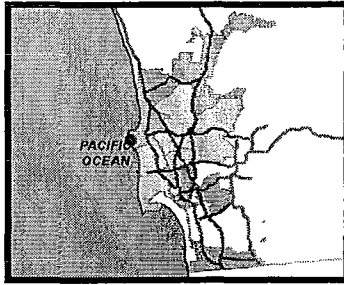
SENIOR ENGINEER
SHEILA BOSE
619-533-4698

PROJECT MANAGER
JERICO GALLARDO
619-533-7523

PROJECT ENGINEER
JAIME RAMOS
619-533-5103

CONSTRUCTION PROJECT
INFORMATION LINE
(619) 533-4207

CITY OF SAN DIEGO
PUBLIC WORKS
DEPARTMENT



Legend

- | | | | | |
|-------------|--------------------|--------------------------|-------------------------|-------------------------|
| ● EX MH | ==== WTR 12-in R/P | ==== SWR 8-in NEW | ==== SWR 8-in Rehab | ■ PRS |
| ● NEW MH | ==== WTR 8-in NEW | ==== SWR 8-in Pipe Burst | ==== SWR 8-in Tunneling | ■ SCADA INSTRUMENTATION |
| ● PVC LINED | ==== WTR 8-in R/P | ==== SWR 8-in R/P | | ==== Sewer Abandonment |
| ● REHAB | ==== WTR 16-in R/P | | | |

COMMUNITY NAME: LA JOLLA



COUNCIL DISTRICT: 1



SAP ID: B-12111 (S) \ B-15216 (W)

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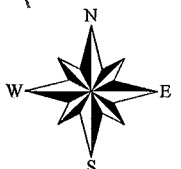
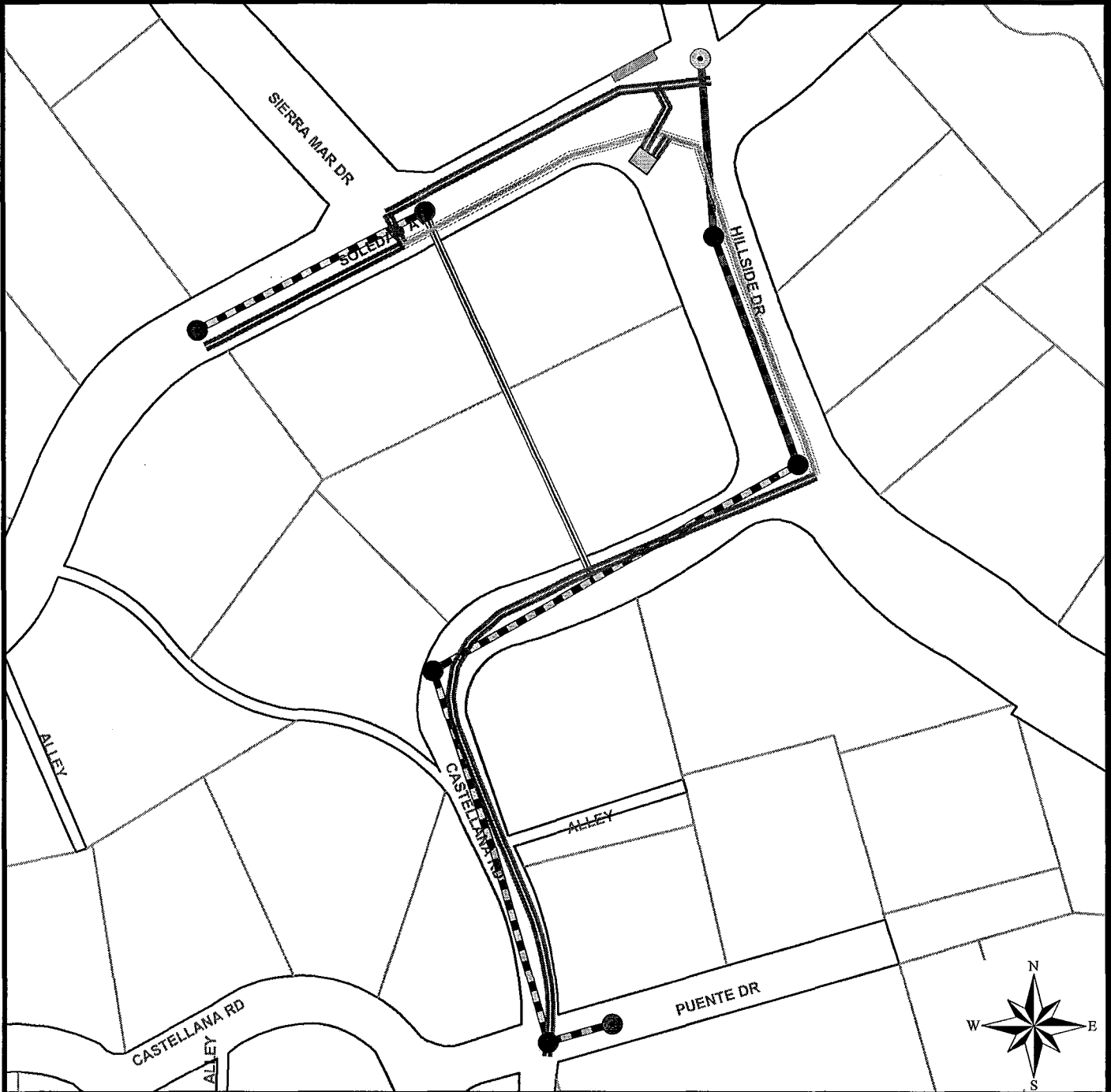
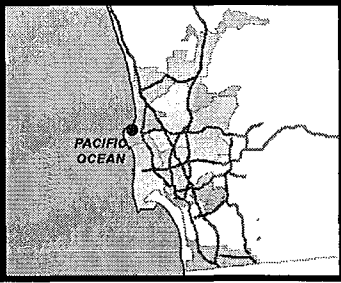
TYRIAN ST & SOLEDAD AVE AND AC WATER MAIN

SENIOR ENGINEER
SHEILA BOSE
619-533-4698

PROJECT MANAGER
JERICO GALLARDO
619-533-7523

PROJECT ENGINEER
JAIME RAMOS
619-533-5103

CONSTRUCTION PROJECT
INFORMATION LINE
(619) 533-4207



Legend

- | | | | | |
|-------------|-----------------|-----------------------|----------------------|-------------------------|
| ● EX MH | ▬ WTR 12-in R/P | ▬ SWR 8-in NEW | ▬ SWR 8-in Rehab | ▬ PRS |
| ● NEW MH | ▬ WTR 8-in NEW | ▬ SWR 8-in Pipe Burst | ▬ SWR 8-in Tunneling | ▬ SCADA INSTRUMENTATION |
| ● PVC LINED | ▬ WTR 8-in R/P | ▬ SWR 8-in R/P | | ▬ Sewer Abandonment |
| ● REHAB | ▬ WTR16-in R/P | | | |



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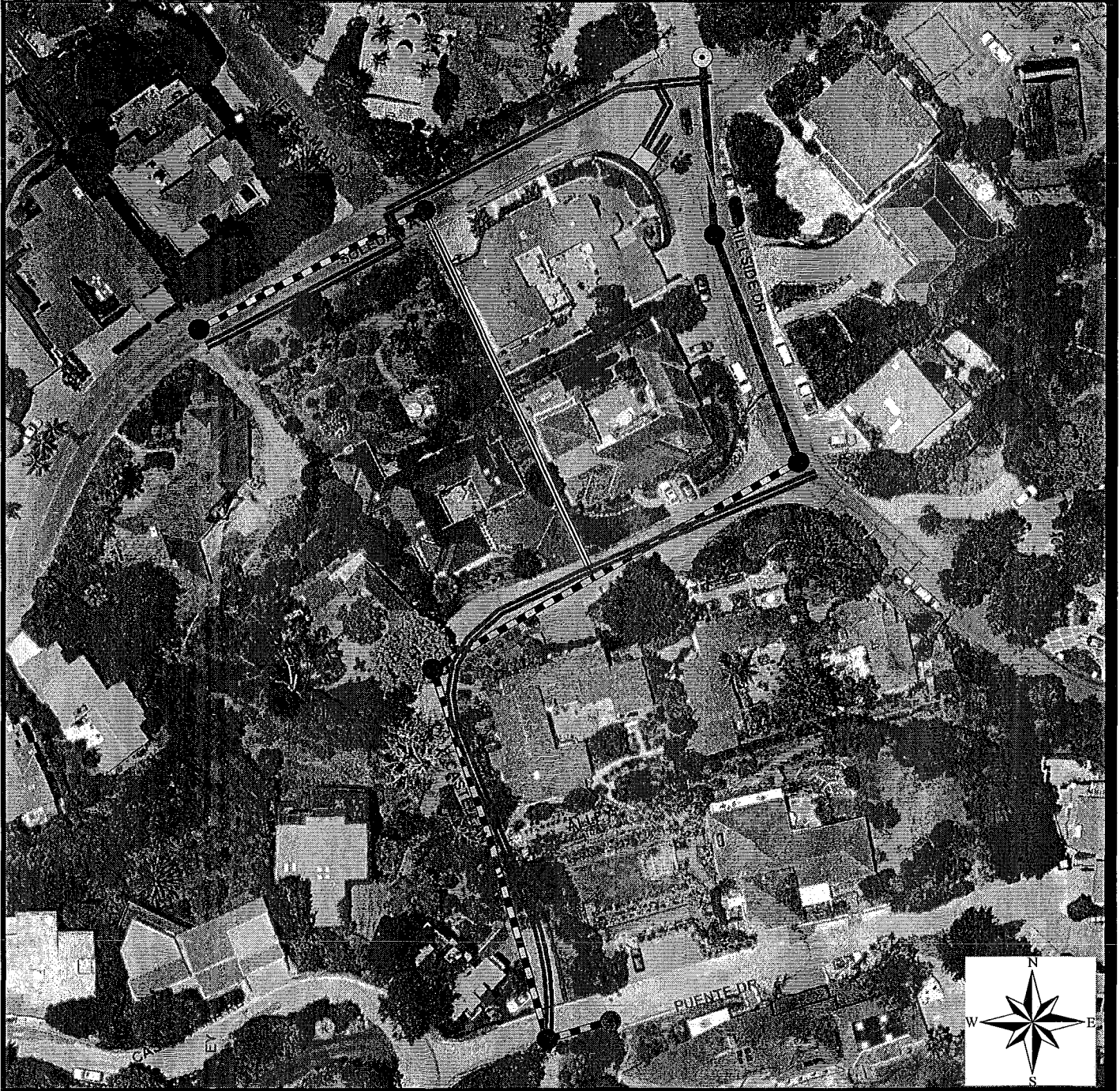
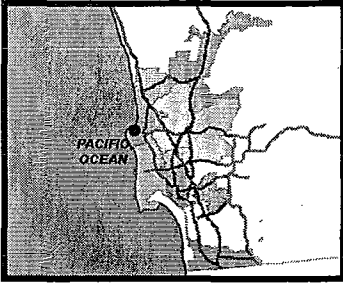
TYRIAN ST & SOLEDAD AVE AND AC WATER MAIN

SENIOR ENGINEER
SHEILA BOSE
619-533-4698

PROJECT MANAGER
JERICO GALLARDO
619-533-7523

PROJECT ENGINEER
JAIME RAMOS
619-533-5103

CONSTRUCTION PROJECT
INFORMATION LINE
(619) 533-4207



Legend

- | | | | | | | | | | |
|---|-----------|------|---------------|------|---------------------|------|--------------------|------|-----------------------|
| ⊙ | EX MH | ==== | WTR 12-in R/P | ---- | SWR 8-in NEW | ---- | SWR 8-in Rehab | ▨ | PRS |
| ● | NEW MH | ==== | WTR 8-in NEW | ---- | SWR 8-in Pipe Burst | ---- | SWR 8-in Tunneling | ▨ | SCADA INSTRUMENTATION |
| ● | PVC LINED | ==== | WTR 8-in R/P | ---- | SWR 8-in R/P | ---- | | ==== | Sewer Abandonment |
| ● | REHAB | ==== | WTR16-in R/P | | | | | | |

COMMUNITY NAME: LA JOLLA

COUNCIL DISTRICT: 1

SAP ID: B-12111 (S) \ B-15216 (W)



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APPENDIX F
ADJACENT PROJECTS

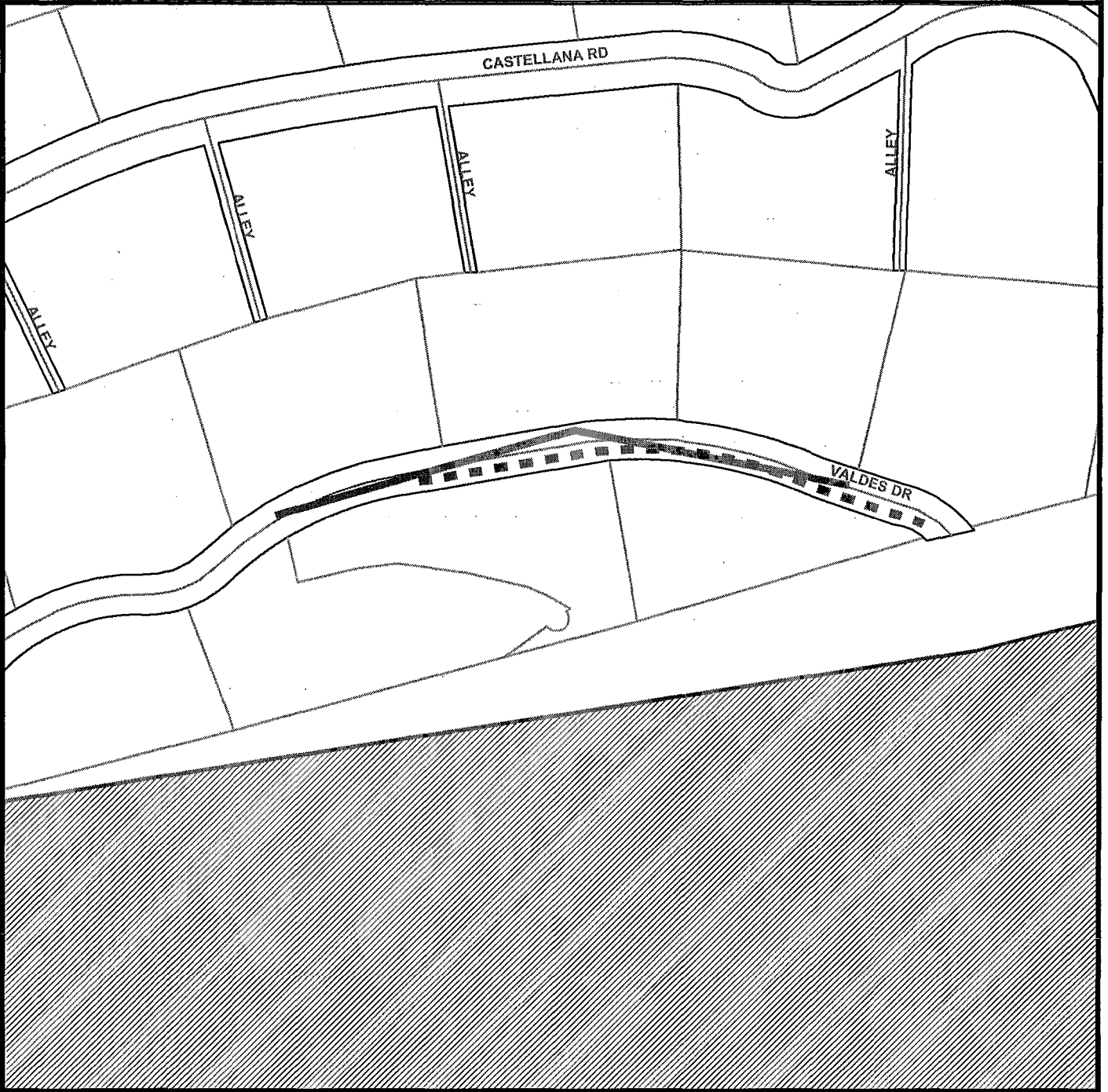
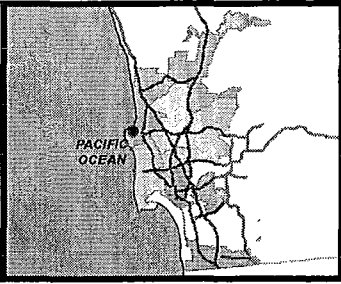
Sewer and AC Water Group Job 834 Location Map (1 of 10)



PROJECT ENGINEER
JENNY JARRELL
619-533-5224

CONSTRUCTION PROJECT
INFORMATION LINE
(619) 533-4207

Right of Way Division



Legend

- Proposed Water
- Proposed Sewer
- MHPA



COMMUNITY NAME: LA JOLLA



COUNCIL DISTRICT: 1



SAP ID: B13099 (S) \ B14141 (W)

Date: May14, 2014

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PREDESIGN LOCATION MAP

AC WATER GROUP 1007



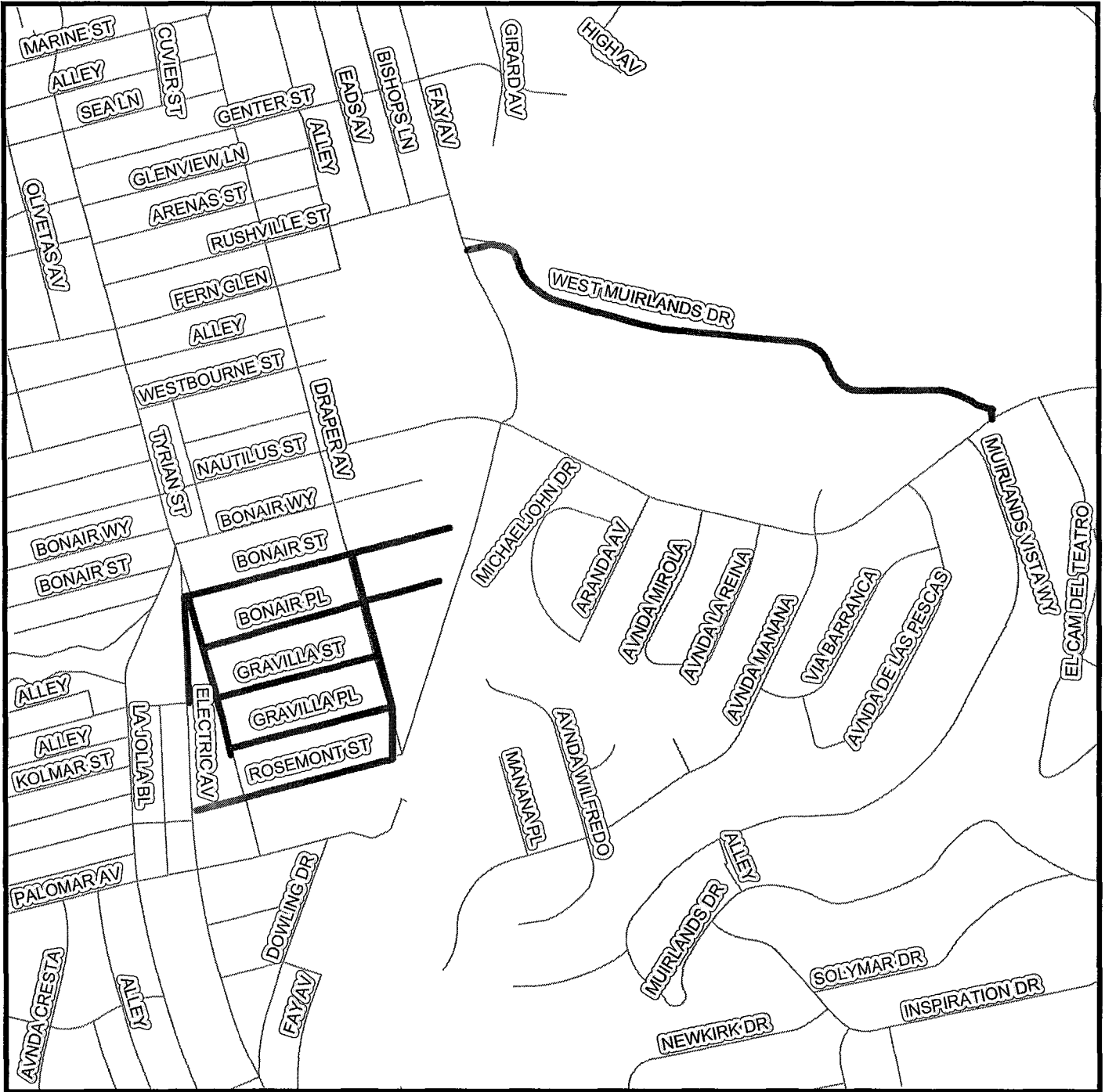
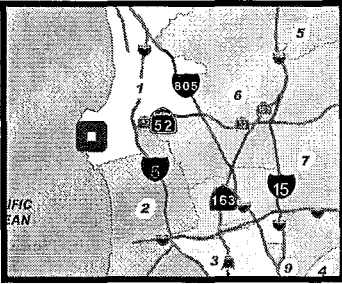
PREDESIGN SENIOR ENGINEER
ALEX GARCIA
(619) 533-3634

PREDESIGN PROJECT MANAGER
TINA HUANG
(619) 533-3863

PREDESIGN PROJECT ENGINEER
LORI TAKAFUJI
(619) 533-3779

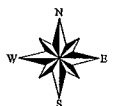
PREDESIGN DRAFTER
TEDDY RAMOS
(619) 533-3734

PROJECT IMPLEMENTATION DIVISION



Legend

— AC Water Group 1007



No Scale

Document Path: S:\PITS\PITS-CIP-Preliminary-Engineering-and-Program-Coordination\Drafting\Water & Sewer Projects\AC Water Projects\AC Water Group 1007\CIP Tracking\Location Maps\VCAT Location Maps\VCAT Location Map 8-26-14.mxd

Community Name: La Jolla

Council District: 1

SAP ID# B15036

Date: 10-27-2014



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APPENDIX G

HYDROSTATIC DISCHARGE FORM

APPENDIX

Hydrostatic Discharge Requirements Certification (Discharge Events < 500,000 gpd)

Discharge activities related to this project comply with the Regional Water Quality Control Board (RWQCB) Order No. 2002-0020, General Permit for Discharges of Hydrostatic Test Water and Potable Water to Surface Water and Groundwater Drains as referenced by (http://www.swrcb.ca.gov/rwqcb9/board_decisions/adopted_orders/2002/2002_0020.shtml), and as follows:

Treated water has been dechlorinated to below <u>0.1 (mg/l)</u> level; and effluent has been maintained between <u>6 and 9 (PH)</u> based on:							<i>is discharge within acceptable limits?</i>		<i>Comment</i>
Event	Discharge Date & Amount (GAL)	Discharge Time	Meter Readings (at source)	Test Results (Chlorine / PH)	Name of Personnel Conducting Tests (print)	*signature of personnel	yes	no	
	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						
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	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						
	Date	Start:	Start:						
	Amt:	End:	End:						

By signing, I certify that all of the statements and conditions for hydrostatic discharge events are correct.

Project Name: _____

Work Order No.(s): _____

Have any thresholds been exceeded? Per Order No. 2002-0020, would this be a reportable discharge and must be reported within 24 hours of the event? [Reportable discharge would include violation of maximum gallons per day, any upset discharges or any effluent limit]

APPENDIX H
HAZARDOUS LABEL/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) _____

UNNA 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
E	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"/>	
F	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	QUANTITY RELEASED
G	ENVIRONMENTAL CONTAMINATION <input type="checkbox"/> AIR <input type="checkbox"/> WATER <input type="checkbox"/> GROUND <input type="checkbox"/> OTHER	TIME OF RELEASE	DURATION OF RELEASE — DAYS — HOURS — MINUTES
H	ACTIONS TAKEN		
I	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) _____		
J	ADVICE REGARDING MEDICAL ATTENTION NECESSARY FOR EXPOSED INDIVIDUALS		
K	COMMENTS (INDICATE SECTION (A - G) AND ITEM WITH COMMENTS OR ADDITIONAL INFORMATION)		
L	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 I

SEWER MAINS AND MANHOLE REHABILITATION SAMPLE DATA TEMPLATES

APPENDIX J

AREAS OF SPECIAL BIOLOGICAL SIGNIFICANCE MAPS

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 from the SANDAG Regional Information System which cannot be reproduced without the written permission of SANDAG. This product may contain information reproduced with permission granted by RAND McNALLY & COMPANY to SanGIS. This map is copyrighted.

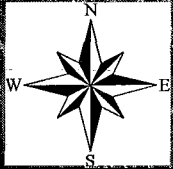
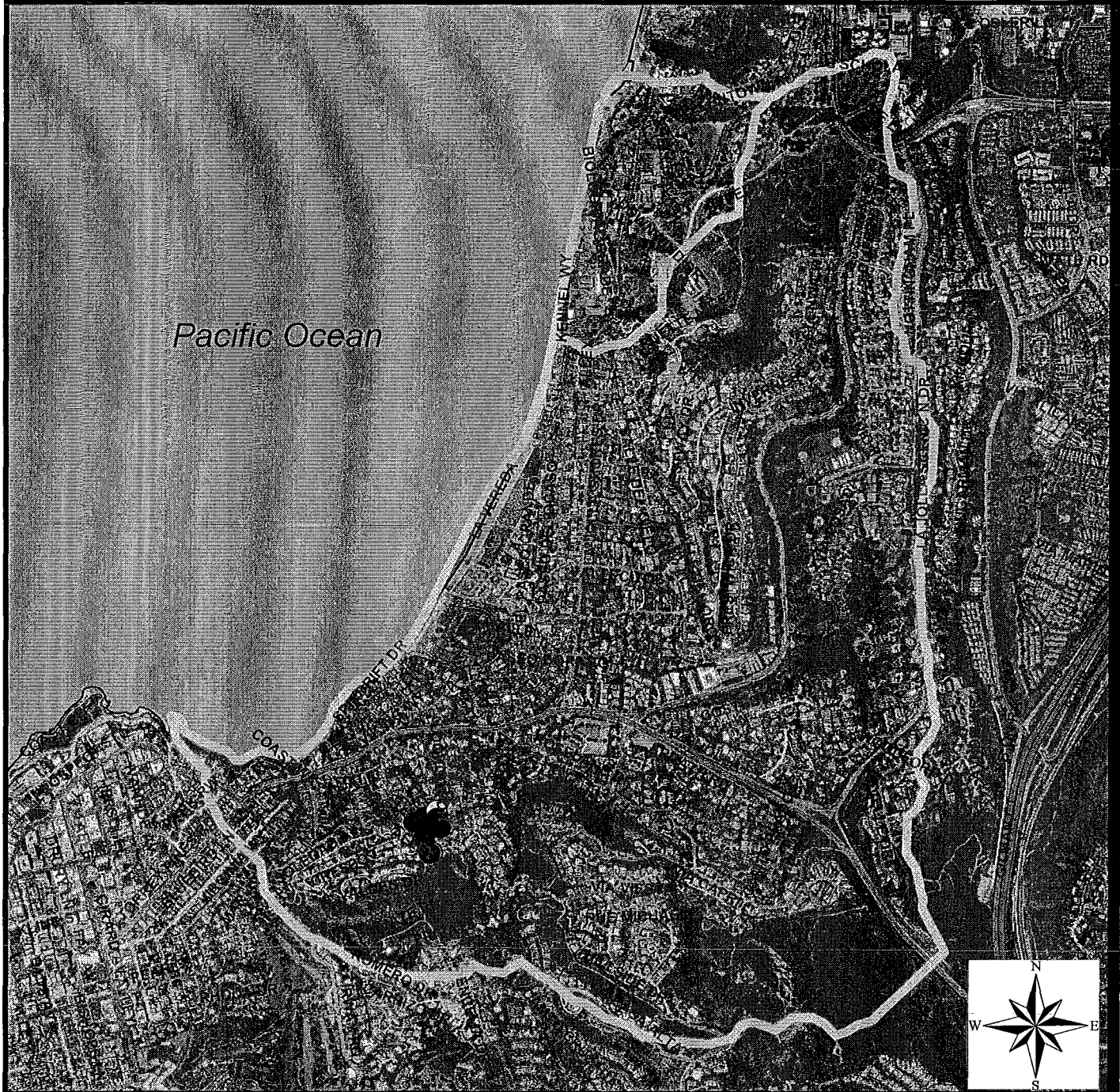
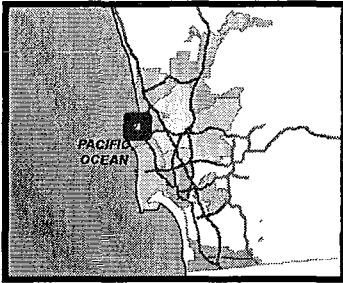
Areas of Special Biological Significance Map: Tyrian St & Soledad Ave and AC Water Main

SENIOR ENGINEER
SHEILA BOSE
619-533-4698

PROJECT MANAGER
JERICHO GALLARDO
619-533-7523

PROJECT ENGINEER
JAIME RAMOS
619-533-5103

CONSTRUCTION PROJECT
INFORMATION LINE
(619) 533-4207



Legend

- | | | | | |
|-------------|-----------------|-----------------------|----------------------|-------------------|
| ● EX MH | ▬ WTR 12-in R/P | ▬ SWR 8-in NEW | ▬ SWR 8-in Rehab | ▭ ASBS Watersheds |
| ● NEW MH | ▬ WTR 8-in NEW | ▬ SWR 8-in Pipe Burst | ▬ SWR 8-in Tunneling | |
| ● PVC LINED | ▬ WTR 8-in R/P | ▬ SWR 8-in R/P | ▬ Sewer Abandonment | |
| ● REHAB | ▬ WTR16-in R/P | | | |

COMMUNITY NAME: LA JOLLA

COUNCIL DISTRICT: 1

SAP ID: B-12111 (S) \ B-15216 (W)

e-Plan of Tyrian St. and Soledad Ave. and AC Water Main



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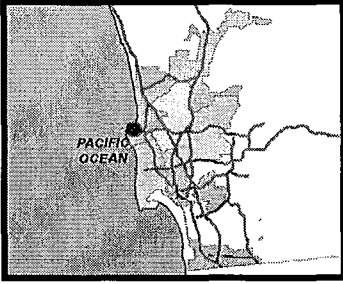
Areas of Special Biological Significance Map: Tyrian St & Soledad Ave and AC Water Main

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Legend

- | | | | | | | | | | |
|---|-----------|-------|---------------|-------|---------------------|-------|--------------------|---|-----------------|
| ⊙ | EX MH | ===== | WTR 12-in R/P | ===== | SWR 8-in NEW | ===== | SWR 8-in Rehab | ▭ | ASBS Watersheds |
| ● | NEW MH | ===== | WTR 8-in NEW | ===== | SWR 8-in Pipe Burst | ===== | SWR 8-in Tunneling | | |
| ● | PVC LINED | ===== | WTR 8-in R/P | ===== | SWR 8-in R/P | ===== | Sewer Abandonment | | |
| ● | REHAB | ===== | WTR 16-in R/P | | | | | | |

COMMUNITY NAME: LA JOLLA

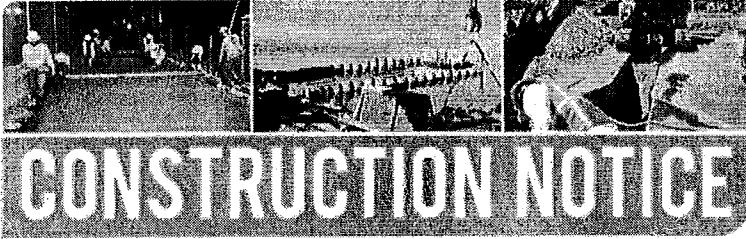
COUNCIL DISTRICT: 1

SAP ID: B-12111 (S) \ B-15216 (W)



APPENDIX K

SAMPLE OF PUBLIC NOTICES



PROJECT NAME

PROJECT NAME

The work will consist of:

- *Edit this information:* The construction work will include pot holing in the northbound curb lane of Torrey Pines Road between Coast Walk and Princess Street.

How your neighborhood may be impacted:

- *Edit this information:* Traffic delays due to lane closure.
- Two-way traffic will be maintained at all times.

Anticipated Construction Schedule

- *Edit this information:* The project upgrades for the entire neighborhood have been ongoing and now are scheduled to start on your street.
- The entire neighborhood project started in ____ and is anticipated to be complete in ____.

Hours and Days of Operation

- *Edit this information:* Monday to Friday (7:30 a.m. to 4 p.m.)

The work will consist of:

- *Edit this information:* The construction work will include pot holing in the northbound curb lane of Torrey Pines Road between Coast Walk and Princess Street.

How your neighborhood may be impacted:

- *Edit this information:* Traffic delays due to lane closure.
- Two-way traffic will be maintained at all times.

Anticipated Construction Schedule

- *Edit this information:* The project upgrades for the entire neighborhood have been ongoing and now are scheduled to start on your street.
- The entire neighborhood project started in ____ and is anticipated to be complete in ____.

Hours and Days of Operation

- *Edit this information:* Monday to Friday (7:30 a.m. to 4 p.m.)

For questions related to this work

Call: (619) 533-4207

Email: engineering@sandiego.gov

Visit: sandiego.gov/CIP

For questions related to this work

Call: (619) 533-4207

Email: engineering@sandiego.gov

Visit: sandiego.gov/CIP



This information is available in alternative formats upon request.



This information is available in alternative formats upon request.

ATTACHMENT F
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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 PK MECHANICAL SYSTEMS, INC., herein called "Contractor" for construction of **Tyrian St. and Soledad Ave. and AC Water Main**; Bid No. **K-16-1223-DBB-3**; in the amount of ONE MILLION FOUR HUNDRED AND THIRTEEN THOUSAND NINE HUNDRED DOLLARS AND ZERO CENTS (\$1,413,900.00), which is comprised of the Base Bid alone.

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.
 - (e) That certain documents entitled **Tyrian St. and Soledad Ave. and AC Water Main**, on file in the office of the Public Works Department as Document No. **B12111/B15216**, 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 **Tyrian St. and Soledad Ave. and AC Water Main**, Bid Number **K-16-1223-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

Jan I. Goldsmith, City Attorney

By 

By 


Print Name: Eleida Felix Yackel
Senior Contract Specialist
Public Works Department

Print Name: Pedro De Lara, Jr.
Deputy City Attorney

Date: 8/10/16

Date: 8/12/16

CONTRACTOR

By 

Print Name: David Spindler

Title: CEO

Date: 5/23/16

City of San Diego License No.: B2013064035

State Contractor's License No.: 810564

DEPARTMENT OF INDUSTRIAL RELATIONS (DIR) REGISTRATION NUMBER: 1000013416

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 7-13.3, "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

AMERICAN 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 American With Disabilities Act (ADA) outlined in the WHITEBOOK, Section 7-13.2, "American 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 7-13.4, ("Contractor Standards"), of the project specifications, and that Contractor has complied with those requirements.

I further certify that each of the Contractor's subcontractors whose subcontracts are greater than \$50,000 in value has completed a Pledge of Compliance attesting under penalty of perjury of having complied with City of San Diego Municipal Code § 22.3004.

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:

(Name of Project or Task)

as particularly described in said contract and identified as Bid No. _____ ; SAP No. (WBS/IO/CC) _____; 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 _____, _____.

_____ Contractor

by

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

COMPANY LETTERHEAD
CERTIFICATE OF COMPLIANCE

Materials and Workmanship Compliance

For Contract or Task _____

I certify that the material listed below complies with the materials and workmanship requirements of the Caltrans Contract Plans, Special Provisions, Standard Specifications, and Standard Plans for the contract listed above.

I also certify that I am an official representative for _____, the manufacturer of the material listed above. Furthermore, I certify that where California test methods, physical or chemical test requirements are part of the specifications, that the manufacturer has performed the necessary quality control to substantiate this certification.

Material Description:

Manufacturer: _____
Model: _____
Serial Number (if applicable) _____
Quantity to be supplied: _____
Remarks: _____

Signed by: _____

Printed Name: _____

Title: _____

Company: _____

Date: _____

City of San Diego
Public Works Department, Field Division

NOTICE OF MATERIALS TO BE USED

To: _____ Date: _____, 20__

Resident Engineer

You are hereby notified that the materials required for use under Contract No. _____
for construction of _____

in the City of San Diego, will be obtained from sources herein designated.

CONTRACT ITEM NO. (Bid Item)	KIND OF MATERIAL (Category)	NAME AND ADDRESS WHERE MATERIAL CAN BE INSPECTED (At Source)

It is requested that you arrange for a sampling, testing, and inspection of the materials prior to delivery, in accordance with Section 4-1.11 of the WHITEBOOK, where it is practicable, and in accordance with your policy. It is understood that source inspection does not relieve the Contractor of full responsibility for incorporating in the work, materials that comply in all respects with the contract plans and specifications, nor does it preclude subsequent rejection of materials found to be undesirable or unsuitable.

Distribution:

Supplier

Yours truly,

Signature of Supplier

Address

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	CONSTRUCTOR OR DESIGNER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED	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.

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. EQUAL BENEFITS ORDINANCE - CERTIFICATION
OF COMPLIANCE**

**Bids will not be accepted until ALL forms are submitted
as part of the bid submittal**

BID BOND

**See Instructions to Bidders, Bidder Guarantee of Good Faith
(Bid Security)**

KNOW ALL MEN BY THESE PRESENTS,

That _____ as Principal, and
_____ 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

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 _____ day of _____, 20_____

_____ (SEAL)

_____ (SEAL)

(Principal)

(Surety)

By: _____

By: _____

(Signature)

(Signature)

(SEAL AND NOTARIAL ACKNOWLEDGEMENT OF SURETY)

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: _____

Certified By _____ Title _____

Name

_____ Date _____

Signature

USE ADDITIONAL FORMS AS NECESSARY

**EQUAL BENEFITS ORDINANCE
CERTIFICATION OF COMPLIANCE**



For additional information, contact:

CITY OF SAN DIEGO

EQUAL BENEFITS PROGRAM

202 C Street, MS 9A, San Diego, CA 92101

COMPANY INFORMATION

Company Name:	Contact Name:
Company Address:	Contact Phone:
	Contact Email:

CONTRACT INFORMATION

Contract Title:	Start Date:
Contract Number (if no number, state location):	End Date:

SUMMARY OF EQUAL BENEFITS ORDINANCE REQUIREMENTS

The Equal Benefits Ordinance [EBO] requires the City to enter into contracts only with contractors who certify they will provide and maintain equal benefits as defined in SDMC §22.4302 for the duration of the contract. To comply:

- Contractor shall offer equal benefits to employees with spouses and employees with domestic partners.
 - Benefits include health, dental, vision insurance; pension/401(k) plans; bereavement, family, parental leave; discounts, child care; travel/relocation expenses; employee assistance programs; credit union membership; or any other benefit.
 - Any benefit not offer an employee with a spouse, is not required to be offered to an employee with a domestic partner.
- Contractor shall post notice of firm's equal benefits policy in the workplace and notify employees at time of hire and during open enrollment periods.
- Contractor shall allow City access to records, when requested, to confirm compliance with EBO requirements.
- Contractor shall submit *EBO Certification of Compliance*, signed under penalty of perjury, prior to award of contract.

NOTE: This summary is provided for convenience. Full text of the EBO and Rules Implementing the EBO are available at www.sandiego.gov/administration.

CONTRACTOR EQUAL BENEFITS ORDINANCE CERTIFICATION

Please indicate your firm's compliance status with the EBO. The City may request supporting documentation.

- I affirm **compliance** with the EBO because my firm (*contractor must select one reason*):
- Provides equal benefits to spouses and domestic partners.
 - Provides no benefits to spouses or domestic partners.
 - Has no employees.
 - Has collective bargaining agreement(s) in place prior to January 1, 2011, that has not been renewed or expired.
- I request the City's approval to pay affected employees a cash equivalent in lieu of equal benefits and verify my firm made a reasonable effort but is not able to provide equal benefits upon contract award. I agree to notify employees of the availability of a cash equivalent for benefits available to spouses but not domestic partners and to continue to make every reasonable effort to extend all available benefits to domestic partners.

It is unlawful for any contractor to knowingly submit any false information to the City regarding equal benefits or cash equivalent associated with the execution, award, amendment, or administration of any contract. [San Diego Municipal Code §22.4307(a)]

Under penalty of perjury under laws of the State of California, I certify the above information is true and correct. I further certify that my firm understands the requirements of the Equal Benefits Ordinance and will provide and maintain equal benefits for the duration of the contract or pay a cash equivalent if authorized by the City.

_____	_____	_____
Name/Title of Signatory	Signature	Date

FOR OFFICIAL CITY USE ONLY

Receipt Date:	EBO Analyst:	<input type="checkbox"/> Approved	<input type="checkbox"/> Not Approved – Reason:
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(Rev 02/15/2011)

CALIFORNIA ALL-PURPOSE ACKNOWLEDGMENT

CIVIL CODE § 1189

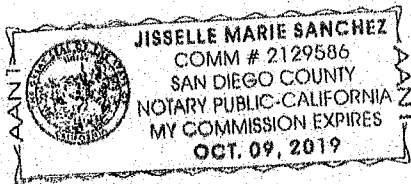
A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California)
County of SAN DIEGO)
On 04/26/2016 before me, JISSELLE MARIE SANCHEZ, NOTARY PUBLIC
Date Here Insert Name and Title of the Officer
personally appeared MARK D. IATAROLA
Name(s) of Signer(s)

who proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.



Signature *J. Sanchez*
Signature of Notary Public

Place Notary Seal Above

OPTIONAL

Though this section is optional, completing this information can deter alteration of the document or fraudulent reattachment of this form to an unintended document.

Description of Attached Document

Title or Type of Document: _____ Document Date: _____
Number of Pages: _____ Signer(s) Other Than Named Above: _____

Capacity(ies) Claimed by Signer(s)

Signer's Name: MARK D. IATAROLA Signer's Name: _____
 Corporate Officer -- Title(s): _____ Corporate Officer -- Title(s): _____
 Partner -- Limited General Partner -- Limited General
 Individual Attorney in Fact Individual Attorney in Fact
 Trustee Guardian or Conservator Trustee Guardian or Conservator
 Other: _____ Other: _____
Signer Is Representing: _____ Signer Is Representing: _____

POWER OF ATTORNEY

**AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY**

KNOW ALL MEN BY THESE PRESENTS: That American Contractors Indemnity Company, a California corporation, Texas Bonding Company, an assumed name of American Contractors Indemnity Company, United States Surety Company, a Maryland corporation and U.S. Specialty Insurance Company, a Texas corporation (collectively, the "Companies"), do by these presents make, constitute and appoint:

John G. Maloney, Mark D. Iatarola or Helen Maloney of Escondido, California

its true and lawful Attorney(s)-in-fact, each in their separate capacity if more than one is named above, with full power and authority hereby conferred in its name, place and stead, to execute, acknowledge and deliver any and all bonds, recognizances, undertakings or other instruments or contracts of suretyship to include riders, amendments, and consents of surety, providing the bond penalty does not exceed *****Fifteen Million***** Dollars (\$ *15,000,000.00*).

This Power of Attorney shall expire without further action on December 20, 2017. This Power of Attorney is granted under and by authority of the following resolutions adopted by the Boards of Directors of the Companies:

Be It Resolved, that the President, any Vice-President, any Assistant Vice-President, any Secretary or any Assistant Secretary shall be and is hereby vested with full power and authority to appoint any one or more suitable persons as Attorney(s)-in-fact to represent and act for and on behalf of the Company subject to the following provisions:

Attorney-in-Fact may be given full power and authority for and in the name of and on behalf of the Company, to execute, acknowledge and deliver, any and all bonds, recognizances, contracts, agreements or indemnity and other conditional or obligatory undertakings, including any and all consents for the release of retained percentages and/or final estimates on engineering and construction contracts, and any and all notices and documents canceling or terminating the Company's liability thereunder, and any such instruments so executed by any such Attorney-in-Fact shall be binding upon the Company as if signed by the President and sealed and effected by the Corporate Secretary.

Be It Resolved, that the signature of any authorized officer and seal of the Company heretofore or hereafter affixed to any power of attorney or any certificate relating thereto by facsimile, and any power of attorney or certificate bearing facsimile signature or facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached.

IN WITNESS WHEREOF, The Companies have caused this instrument to be signed and their corporate seals to be hereto affixed, this 1st day of December, 2014.

**AMERICAN CONTRACTORS INDEMNITY COMPANY TEXAS BONDING COMPANY
UNITED STATES SURETY COMPANY U.S. SPECIALTY INSURANCE COMPANY**

Corporate Seals



By:

Daniel P. Aguilar, Vice President

A notary public or other officer completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

State of California
County of Los Angeles SS:

On this 1st day of December, 2014, before me, Maria G. Rodriguez-Wong, a notary public, personally appeared Dan P. Aguilar, Vice President of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company who proved to me on the basis of satisfactory evidence to be the person whose name is subscribed to the within instrument and acknowledged to me that he executed the same in his authorized capacity, and that by his signature on the instrument the person, or the entity upon behalf of which the person acted, executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.
WITNESS my hand and official seal.

Signature

(Seal)



I, Michael Chalekson, Assistant Secretary of American Contractors Indemnity Company, Texas Bonding Company, United States Surety Company and U.S. Specialty Insurance Company, do hereby certify that the above and foregoing is a true and correct copy of a Power of Attorney, executed by said Companies, which is still in full force and effect; furthermore, the resolutions of the Boards of Directors, set out in the Power of Attorney are in full force and effect.

In Witness Whereof, I have hereunto set my hand and affixed the seals of said Companies at Los Angeles, California this 26TH day of APRIL, 2016

Corporate Seals



Michael Chalekson, Assistant Secretary

Bond No. _____
Agency No. 4013

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.

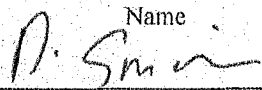
- The undersigned certifies that within the past 10 years the Bidder has NOT been the subject of a complaint or pending action in a legal administrative proceeding alleging that Bidder discriminated against its employees, subcontractors, vendors or suppliers.

- 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: PK Mechanical Systems, Inc.

Certified By David Spindler Title CEO

Name

 Signature

Date 4/4/16

USE ADDITIONAL FORMS AS NECESSARY

**EQUAL BENEFITS ORDINANCE
CERTIFICATION OF COMPLIANCE**



For additional information, contact:
CITY OF SAN DIEGO

EQUAL BENEFITS PROGRAM

202 C Street, MS 9A, San Diego, CA 92101

COMPANY INFORMATION	
Company Name: PK Mechanical Systems, Inc.	Contact Name: David Spindler
Company Address: 21335 Bundy Canyon road Wildomar CA 92595	Contact Phone: 951-453-8946 Contact Email: dspin@pkmech.net

CONTRACT INFORMATION	
Contract Title: Tyrian Street and Soledad Ave. AC water main	Start Date: TBD
Contract Number (if no number, state location): San Diego	End Date: TBD

SUMMARY OF EQUAL BENEFITS ORDINANCE REQUIREMENTS

The Equal Benefits Ordinance [EBO] requires the City to enter into contracts only with contractors who certify they will provide and maintain equal benefits as defined in SDMC §22.4302 for the duration of the contract. To comply:

- Contractor shall offer equal benefits to employees with spouses and employees with domestic partners.
 - Benefits include health, dental, vision insurance; pension/401(k) plans; bereavement, family, parental leave; discounts, child care; travel/relocation expenses; employee assistance programs; credit union membership; or any other benefit.
 - Any benefit not offer an employee with a spouse, is not required to be offered to an employee with a domestic partner.
- Contractor shall post notice of firm's equal benefits policy in the workplace and notify employees at time of hire and during open enrollment periods.
- Contractor shall allow City access to records, when requested, to confirm compliance with EBO requirements.
- Contractor shall submit *EBO Certification of Compliance*, signed under penalty of perjury, prior to award of contract.

NOTE: This summary is provided for convenience. Full text of the EBO and Rules Implementing the EBO are available at www.sandiego.gov/administration.

CONTRACTOR EQUAL BENEFITS ORDINANCE CERTIFICATION

Please indicate your firm's compliance status with the EBO. The City may request supporting documentation.

I affirm **compliance** with the EBO because my firm (*contractor must select one reason*):

- Provides equal benefits to spouses and domestic partners.
- Provides no benefits to spouses or domestic partners.
- Has no employees.
- Has collective bargaining agreement(s) in place prior to January 1, 2011, that has not been renewed or expired.

I request the City's approval to pay affected employees a cash equivalent in lieu of equal benefits and verify my firm made a reasonable effort but is not able to provide equal benefits upon contract award. I agree to notify employees of the availability of a cash equivalent for benefits available to spouses but not domestic partners and to continue to make every reasonable effort to extend all available benefits to domestic partners.

It is unlawful for any contractor to knowingly submit any false information to the City regarding equal benefits or cash equivalent associated with the execution, award, amendment, or administration of any contract. [San Diego Municipal Code §22.4307(a)]
Under penalty of perjury under laws of the State of California, I certify the above information is true and correct. I further certify that my firm understands the requirements of the Equal Benefits Ordinance and will provide and maintain equal benefits for the duration of the contract or pay a cash equivalent if authorized by the City.

David Spindler CEO		4/4/16
Name/Title of Signatory	Signature	Date

FOR OFFICIAL CITY USE ONLY		
Receipt Date:	EBO Analyst:	<input type="checkbox"/> Approved <input type="checkbox"/> Not Approved – Reason:

(Rev 02/15/2011)

PK will use no subs for the alternates.

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	CONSTRUCTOR OR DESIGNER	SUBCONTRACTOR LICENSE NUMBER	TYPE OF WORK	DOLLAR VALUE OF SUBCONTRACT	MBE, WBE, DBE, DVBE, OBE, ELBE, SLBE, SDB, WoSB, HUBZone, OR SDVOSB	WHERE CERTIFIED	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.

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,

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****

Bid Results for Project Tyrian St. and Soledad Ave. and AC Water Main (K-16-1223-DBB-3)
 Issued on 03/29/2016
 Bid Due on May 5, 2016 2:00 PM (Pacific)
 Exported on 05/05/2016

VendorID	Company Name	Address	City	Zip Code	Country	Contact	Phone	Fax	Email	Vendor Type
302410	PK Mechanical Systems	21335 Bundy Canyon Road	Wildomar	92595	United States	David Spindler	951-245-5537	951-226-1171	dspin@pkmech.net	PQUAL,CADR

Responsee	Responsee Title	Responsee Phone	Responsee Email
David Spindler	CEO	951-453-8946	dspin@pkmech.net

Bid Format	Submitted Date	Status	Confirmation #	Ranking
Electronic	May 5, 2016 12:54:18 PM (Pacific)	Submitted	79459	0

Attachments		
File Title	File Name	File Type
PK Tyrian St equal bennies cert	PK Tyrian St equal bennies cert.pdf	General Attachments
PK Tyrian street pending action cert	PK Tyrian ST pending action cert.pdf	General Attachments
PK Tyrian Street bid bond	PK Tyrian Street bid bond.pdf	General Attachments
PK tyrian st additive alternate form	PK Tyrian st K-16-1223-DBB-3 - Subcontractor Additive Deductive Alternate.pdf	General Attachments

Line Items							
Item Num	Section	Item Code	Description	Unit of Measure	Quantity	Unit Price	Line Total
1	Main Bid	524126	Bonds (Payment and Performance)	LS	1	\$20,000.00	\$20,000.00
2	Main Bid	238990	Video Recording of Existing Conditions	LS	1	\$1,000.00	\$1,000.00
3	Main Bid	237310	Traffic Control	LS	1	\$20,000.00	\$20,000.00
4	Main Bid	237110	Mobilization	LS	1	\$39,050.50	\$39,050.50
5	Main Bid		Field Orders - Type II	AL	1	\$77,000.00	\$77,000.00
6	Main Bid	237310	Additional Pavement Removal and Disposal	CY	15	\$100.00	\$1,500.00
7	Main Bid	237310	Adjusting Existing Gate Valve Cover to Grade	EA	8	\$300.00	\$2,400.00
8	Main Bid	237310	Cold Mill AC Pavement (0 - 1 1/2")	SF	4125	\$1.00	\$4,125.00
9	Main Bid	237310	Asphalt Pavement Repair	TON	5	\$1,100.00	\$5,500.00
10	Main Bid	237310	Rubber Polymer Modified Slurry Type II and Striping	SF	13150	\$0.75	\$9,862.50
11	Main Bid	237310	Pavement Restoration Adjacent to Trench	SF	550	\$7.00	\$3,850.00
12	Main Bid	237310	Damaged PCC Pavement Replacement	SF	750	\$10.00	\$7,500.00
13	Main Bid	237310	Concrete Pavement	CY	240	\$350.00	\$84,000.00
14	Main Bid	237310	1-1/2 inch Asphalt Concrete Overlay and Striping	TON	82	\$150.00	\$12,300.00
15	Main Bid	237310	Pavement Fabric	SY	990	\$6.00	\$5,940.00
16	Main Bid	237310	Crack Seal	LB	265	\$10.00	\$2,650.00
17	Main Bid	237310	Contractor Date Stamp and Impressions	EA	12	\$300.00	\$3,600.00
18	Main Bid	237310	Cross Gutter	SF	200	\$17.00	\$3,400.00
19	Main Bid	237310	Additional Curb and Gutter	LF	50	\$45.00	\$2,250.00
20	Main Bid	237310	Additional Sidewalk Removal and Replacement	SF	100	\$15.00	\$1,500.00
21	Main Bid	237310	Curb Ramp Type C2 with Detectable Warning Tiles	EA	1	\$3,000.00	\$3,000.00
22	Main Bid	237310	Curb Ramp Type D with Detectable Warning Tiles	EA	1	\$3,000.00	\$3,000.00
23	Main Bid	237310	Curb Ramp Type C1 with Detectable Warning Tiles	EA	1	\$3,000.00	\$3,000.00
24	Main Bid	237110	Additional Bedding	CY	66	\$50.00	\$3,300.00
25	Main Bid	237310	Temporary Resurfacing	TON	135	\$100.00	\$13,500.00
26	Main Bid	237110	Imported Backfill	TON	190	\$50.00	\$9,500.00
27	Main Bid	237110	8-Inch Sewer Main, Special Strength SDR-26	LF	600	\$150.00	\$90,000.00
28	Main Bid	237110	8-Inch VCES Sewer Main With Concrete Encasement	LF	130	\$170.00	\$22,100.00
29	Main Bid	237110	Thrust Blocks and Anchor Blocks For 16-inch and Larger Water Mains	EA	7	\$500.00	\$3,500.00
30	Main Bid	237110	8-Inch Sewer Main Static Pull Pipe Bursting (Existing 6-Inch Sewer Main)	LF	305	\$200.00	\$61,000.00
31	Main Bid	237110	Manholes (4 x 3)	EA	4	\$6,000.00	\$24,000.00
32	Main Bid	237110	Manholes (4 x 3), PVC Lined	EA	5	\$10,000.00	\$50,000.00
33	Main Bid	237110	Connection to Existing Manhole and Rechanneling,	EA	1	\$5,000.00	\$5,000.00
34	Main Bid	237110	8-Inch Water Main	LF	90	\$85.00	\$7,650.00
35	Main Bid	237110	8-Inch Water Main, Class 305	LF	415	\$90.00	\$37,350.00
36	Main Bid	237110	8-Inch Fusible Water Main Class 305	LF	455	\$105.00	\$47,775.00
37	Main Bid	237110	12-Inch Water Main, Class 305	LF	150	\$100.00	\$15,000.00
38	Main Bid	237110	16-Inch Water Main, Class 305	LF	360	\$130.00	\$46,800.00
39	Main Bid	237110	6-Inch Fire Hydrant Assembly & Marker	EA	2	\$6,000.00	\$12,000.00
40	Main Bid	237110	8-Inch Gate Valve	EA	7	\$2,000.00	\$14,000.00
41	Main Bid	237110	16-Inch Butterfly Valve Class 250B	EA	4	\$4,000.00	\$16,000.00
42	Main Bid	237110	1-Inch Water Service	EA	18	\$2,500.00	\$45,000.00
43	Main Bid	237110	2-Inch Blow off Valve Assembly	EA	1	\$4,000.00	\$4,000.00
44	Main Bid	237110	4-Inch Blow off Valve Assembly	EA	1	\$5,000.00	\$5,000.00
45	Main Bid	237110	8-Inch Pressure Reducing Station with 12' x 10' Concrete Vault per Sheet 12 through Sheet 13, Complete	LS	1	\$150,000.00	\$150,000.00

46	Main Bid	237110	Removal/Abandonment of Existing Facilities of 6-Inch Pressure Reducing Station	LS	1	\$20,000.00	\$20,000.00
47	Main Bid	237110	Instrumentation & Control for Pressure Regulating Station per Sheet E-1 Thru E-13 Complete	LS	1	\$100,000.00	\$100,000.00
48	Main Bid	237110	4-Inch Sewer Lateral and Cleanout (Street)	EA	6	\$1,500.00	\$9,000.00
49	Main Bid	237110	6-Inch Sewer Lateral and Cleanout (Street)	EA	2	\$1,500.00	\$3,000.00
50	Main Bid	237110	Sewer Lateral Connection	EA	2	\$1,000.00	\$2,000.00
51	Main Bid	237110	4-Inch Sewer Lateral with Private Replumbing (6633 Electric Ave)	EA	1	\$7,000.00	\$7,000.00
52	Main Bid	237110	4-Inch Trenchless Method For Private Replumbing (460 Rosemont St)	EA	1	\$9,000.00	\$9,000.00
53	Main Bid	237110	4-Inch Trenchless Method For Private Replumbing (472 Rosemont St)	EA	1	\$9,000.00	\$9,000.00
54	Main Bid	237110	4-Inch Trenchless Method For Private Replumbing (478 Rosemont St)	EA	1	\$15,000.00	\$15,000.00
55	Main Bid	237110	4-Inch Trenchless Method For Private Replumbing (6626 Tyrlian St)	EA	1	\$15,000.00	\$15,000.00
56	Main Bid	237110	4-Inch Trenchless Method For Private Replumbing (1860 Castellana Rd)	EA	1	\$20,000.00	\$20,000.00
57	Main Bid	237110	4-Inch Trenchless Method For Private Replumbing (1865 Soledad Ave)	EA	1	\$12,000.00	\$12,000.00
58	Main Bid	237110	4-Inch Trenchless Method For Private Replumbing (1888 Castellana Rd)	EA	1	\$25,000.00	\$25,000.00
59	Main Bid	237110	6-Inch Trenchless Method For Private Replumbing (462 Rosemont St)	EA	1	\$9,000.00	\$9,000.00
60	Main Bid	237110	6-Inch Trenchless Method For Private Replumbing (470 Rosemont St)	EA	1	\$9,000.00	\$9,000.00
61	Main Bid	237110	8-Inch Directional Drilling Sewer Main	LF	130	\$200.00	\$26,000.00
62	Main Bid	237110	Abandon and Fill Existing 6-Inch Sewer Main Outside of Trench Limit	LF	120	\$10.00	\$1,200.00
63	Main Bid	237110	Abandon and Fill Existing 8-Inch Sewer Main Outside of Trench Limit	LF	225	\$10.00	\$2,250.00
64	Main Bid	237110	Video Inspecting Pipelines and Culverts for Acceptance	LF	1261	\$1.00	\$1,261.00
65	Main Bid	237110	Cleaning and Video Inspecting Pipelines and Culverts	LF	1618	\$2.00	\$3,236.00
66	Main Bid	237110	Rehabilitate 6-Inch Sewer Main	LF	100	\$100.00	\$10,000.00
67	Main Bid	237110	Rehabilitate Existing Manhole	EA	2	\$5,000.00	\$10,000.00
68	Main Bid	237110	Contractor Furnished Materials for the City Forces High-Line Work	LS	1	\$10,000.00	\$10,000.00
69	Main Bid	237110	High-lining Removed by Contractor	LF	2950	\$2.00	\$5,900.00
70	Main Bid	237110	Pavement Restoration for City Forces Final Connection	SF	1500	\$15.00	\$22,500.00
71	Main Bid	237110	Contractor Furnished Materials for City Forces Connection and Cut-In Work for Mains 16-Inch and Larger.	LS	1	\$13,000.00	\$13,000.00
72	Main Bid	541330	Water Pollution Control Program Development (WPCP)	LS	1	\$2,000.00	\$2,000.00
73	Main Bid	237990	Water Pollution Control Program Implementation (WPCP)	LS	1	\$20,000.00	\$20,000.00
74	Main Bid	237110	Sewage Bypass and Pumping Plan (Diversion Plan)	LS	1	\$10,000.00	\$10,000.00
75	Main Bid	237110	Handling and Disposal of Non-friable Asbestos Material	LF	1365	\$10.00	\$13,650.00
						Subtotal	\$1,413,900.00
76	Alternate Items A	237110	High-lining by the Contractor	LS	1	\$20,000.00	\$20,000.00
77	Alternate Items A	237110	High-lining Removed by Contractor (Deductive)	LF	-2950	\$2.00	(\$5,900.00)
78	Alternate Items A	237110	Contractor Furnished Materials for the City Forces High-line Work (Deductive)	LS	-1	\$13,000.00	(\$13,000.00)
						Subtotal	\$1,100.00
79	Alternate Items B	237110	8-Inch through 16-Inch Connections To The Existing System By Contractor	EA	7	\$7,500.00	\$52,500.00
80	Alternate Items B	237110	8-Inch through 16-Inch Cut-In Tee by Contractor	EA	1	\$10,000.00	\$10,000.00
81	Alternate Items B	237110	Cut and Plug of The Existing System By Contractor	EA	2	\$4,000.00	\$8,000.00
82	Alternate Items B	237110	Pavement Restoration for City Forces Final Connection (Deductive)	SF	-1500	\$15.00	(\$22,500.00)
83	Alternate Items B	237110	Contractor Furnished Materials for City Forces Connection and Cut-In Work for Mains 16-Inch and Larger. (Deductive)	LS	-1	\$13,000.00	(\$13,000.00)
						Subtotal	\$35,000.00
						Total	\$1,450,000.00

Subcontractors									
Name	Description	License Num	Amount	Type	Address	Address 2	City	Zip Code	Country
Walch Striping, Inc. dba LSI Road Mark	portions of line items 10 and 14	775886	\$3,020.50	PQUAL	P.O. Box 2426		El Cajon	92021	United States
Nu-Line Technologies, LLC	line item 66	997520	\$9,250.00	FEM,MBE,CADIR,WBE	102 Second Street, Suite B		Encinitas	92024	United States
Inland Valley Engineering, Inc.	line items 52 through 61	850477	\$93,400.00	CAU,MALE,SDB	27475 Ynez Road #627		Temecula	92592	United States
Coastal Pipeline Services	line items 64 and 65	878225	\$2,851.65	DBE,ELBE,LAT,MALE,MBE	P.O. Box 235653		Encinitas	92023	United States
G. Scott Asphalt, Inc.	line item 10	751836	\$8,191.00		358 Trousdale Drive		Ciudad Vista	91910	United States
Moccon Trenchless	line items 30 and 50	565735	\$32,500.00		49950 Jefferson		Indio	92201	United States
Kirk Paving, Inc.	Items 8, 9, 14, 15 and portions of 27, 28, 35 and	749206	\$110,000.00	PQUAL,SLBE,CADIR	8722 Winter Gardens Blvd.		Lakeside	92040	United States
Sapphire Electric, Inc.	Line Item # 47	809701	\$84,620.00	ELBE	1948 Don Lee Place, Suite 1, Escondido, CA, 92029		Escondido	92029	United States
MIRAMAR GENERAL ENGINEERING	line items 13 and 17 through 23	1009541	\$98,734.00	ELBE,PQUAL	8400 Miramar Rd	Suite 22A	San Diego	92126	United States

Prime Self-Performance
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